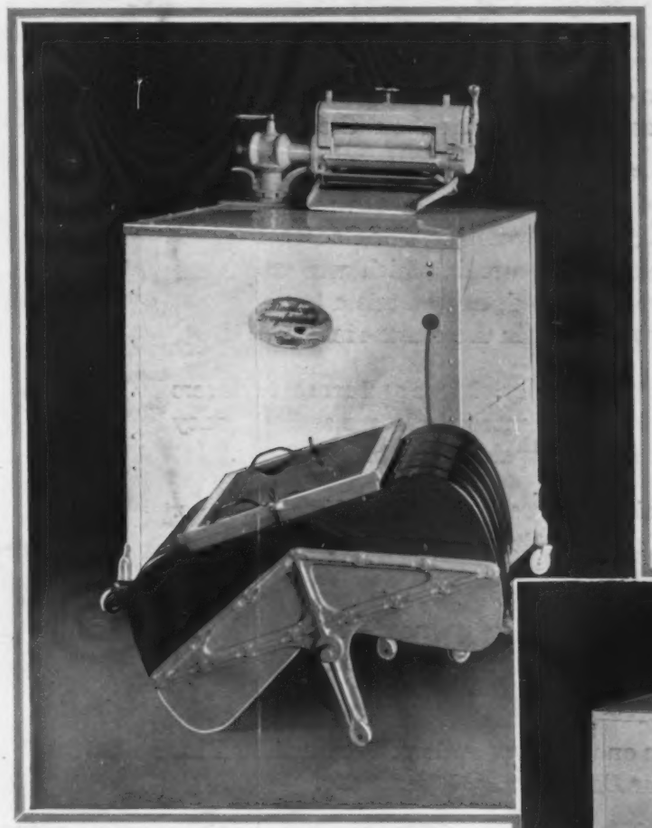
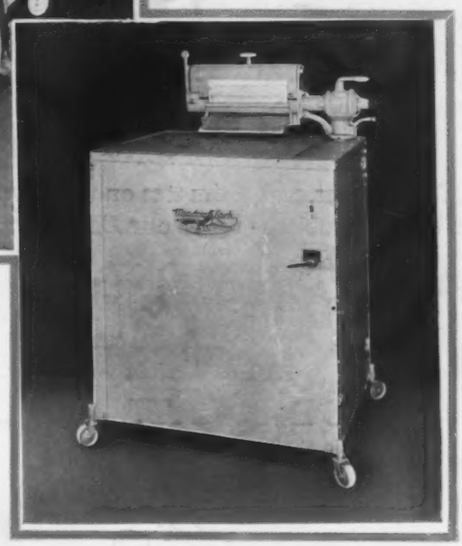
Journal of Electricity and Western Industry

25 Cents a Copy | March 15, 1923 | San Francisco





Above is shown the Meadows Greyhound—the Oscillator Plus. At the right is the Meadow Lark.

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Journal of Electricity and Western Industry entered as second class matter February 17, 1921, at the post office at San Francisco, under the Act of Congress, March 3, 1879.
Published the 1st and 15th of each month, at Rialto Building, San Francisco, California.

MAR 26 1923 ©CIB573152

Journal of Electricity and Western Industry

A McGraw-Hill Publication

Established 1887

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VOLUME 50 | SAN FRANCISCO, MARCH 15, 1923 | NUMBER 6

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PUBLISHED SEMI-MONTHLY BY

McGRAW-HILL COMPANY OF CALIFORNIA — Rialto Building — SAN FRANCISCO

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Member Audit Bureau of Circulation
Printed in U. S. A.

McGRAW-HILL CO., Inc., New York
Publishers of

American Machinist—European Edition (*Published in London*)

Industrial Engineer (*Published in Chicago*)

Chemical and Metallurgical Engineering
American Machinist — Ingeniería Internacional
Electrical World — Electric Railway Journal
Engineering and Mining Journal-Press
Bus Transportation — Engineering News Record
Coal Age — Electrical Merchandising — Power

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The Lure of the White Collar Job

A SHORTAGE of skilled craftsmen in all branches of the building industry is a condition prevalent in all sections. Under the stress of a building program, which in the seven far western states amounted to over twenty-five million dollars a month during 1922, many jobs have been seriously hampered by a lack of competent men. This shortage is not confined to any particular craft, neither is it influenced by closed or open shops, union or non-union conditions, nor by wages to any great extent. There is every evidence that the building industry will be characterized by great activity for an indefinite period. The natural growth of the western states will insure that. A national housing shortage will stimulate it.

APPRENTICE schools are badly needed, schools of practical instruction which will take the promising youth and fit him rapidly for a place in industrial life. Since they are the most interested, the duty of founding and supporting these schools should fall upon the Contractors' Associations, Chambers of Commerce and Builders' Exchanges. Local attempts to meet specific situations have been eminently successful. An example in point is the plumbing and plastering schools of the Industrial Association of San Francisco.

THE source from which to recruit the workers necessary to supplement the supply of skilled craftsmen is partially available in the ranks of unskilled laborers. But the best material will be found in the stream of young men annually flowing into subordinate positions in mercantile and professional fields. Opportunities in the skilled trades have never been made apparent to the average youth fresh from our schools. He can only see himself in overalls, dependent upon casual employment all his life. He is too often lured to the white collared job by visions which do not materialize in after years. Many excellent craftsmen would be forthcoming if the opportunities available were presented in an attractive light.

IT IS certainly the duty of our employers' associations to help to the fullest extent those of our workers who find themselves out of employment through lack of sufficient training to enable them to enjoy greater remuneration for their larger efforts as skilled craftsmen. Facilities for training men and boys is a community responsibility and the cooperation of educational institutions could well be solicited.

THE American youth is an idealist. He starts out with the intention of some day owning his own business. His future career is influenced largely by his parents, and the literature he reads. He has ample opportunity to hear advice from addresses in his school from professional and mercantile leaders. Unconsciously he is influenced against manual labor, represented by the skilled industrial branches. Thus the professions are overcrowded with mediocre practitioners who are excellent potential craftsmen.

ONCE the opportunity is made available in the form of apprentice schools the high wages and regular hours of the skilled trades will cause a wholesale desertion from white collar jobs of long hours and small pay, to the equally honorable garb of the humble overalls.

Underwriters Laboratory to Be Established on Pacific Coast

ELECTRICAL research and invention and the manufacture of electrical appliances, devices and materials in the region west of the Rocky Mountains will receive added stimulus from the establishment on the Pacific Coast of a branch laboratory of Underwriters' Laboratories, Inc., announcement of which is made on another page in this issue. At the present time this organization maintains but two other such laboratories, one in Chicago and one in New York, and it is planned to open a San Francisco branch co-important with the one in New York City.

Every new piece of electrical equipment, be it a snap switch or a generator, must receive the stamp of approval of the underwriters before it can be placed on the market or installed. Should it not receive this approval and should it not be included in the "List of Approved Devices" it is doomed to failure from a commercial standpoint. In the past every new device which was brought out by a western manufacturer or perfected by a western inventor has been sent to the Chicago laboratory for testing. Not only has the expense been considerable and the loss of time irksome, but necessary personal contact has been impossible. These obstacles will now be removed to the benefit of all concerned.

Testing and approving new devices is but one of the many services which the laboratory will offer. Considerable research will be undertaken and much valuable information will undoubtedly be uncovered. Thus should a manufacturer desire to know the best insulating material to use in connection with a new switch, he needs but turn to the laboratory and he will be furnished with an approved list showing the characteristics of each kind of material. Service of this sort is bound to prove immensely valuable.

Electrical manufacturers in the western states will welcome the announcement of the establishment of a branch of the Underwriters' Laboratories in the West.

Increasing Interest Being Shown in Ethics of the Engineering Profession

THE recent publication by the American Institute of Electrical Engineers of a new edition of the Code of Principles of Professional Conduct adopted by the Institute in 1912, brings to mind the decided trend toward the formulation and adoption of codes of ethics by numerous organizations in different fields of activity. Such codes have become important agencies in upholding high ideals in the constantly broadening social, economic, and industrial relations of the various groups concerned.

The engineering profession was slow to adopt such codes, because of the prevalence of the more general view that an adherence to the Golden Rule would meet all requirements without formulating specific applications to the engineering field. The broadening concept of the profession, due to its increasing contacts with the varied activities of life, gradually brought about a realization that a simple statement of desirable procedures in many of the more common relations of groups and individuals within the profession, would be very helpful, particularly to the younger engineers.

These views led to the adoption of the Code by the A.I.E.E. in 1912. Ten years later, namely, in March, 1922, the Board of Directors of the Institute adopted resolutions reaffirming adherence to the 1912 Code, which "had served its purpose effectively during the past ten years."

Since the adoption of the Code by the Institute in 1912, several other engineering societies have also adopted codes of conduct, including the national societies of civil and mechanical engineers; and these other societies have also established committees or other agencies for the administration and enforcement of such codes.

An interesting feature which is clearly brought out by a comparison of the more recently adopted codes with the original, is that viewed all together they form strong endorsement of the principle of standardization. Some of these codes were prepared independently, purely in response to the demand for briefer and simpler statements of the leading principles; but after these had passed through the hands of the many who assisted with criticisms, and were brought out in their respective final forms, their resemblance to the Code of the Electrical Institute is striking. They not only cover practically the same subjects and are expressed in substantially the same language, but their authors have seen fit, after much consideration, to make their general structure, that is, the division of subjects and the arrangement, follow very closely the A.I.E.E. Code of 1912.

Proposed Engineering License Bill Is Live Issue in California

THE proposal to introduce in the California legislature a bill licensing engineers has aroused much interest and discussion among engineers in that state since its promulgation a few months ago. The consensus of opinion among those interested in a licensing law seems to be that such would be desirable both from the standpoint of public welfare and the benefit to the profession. Some engineers, while in favor of licensing or regulation, can not agree on the provisions, others are definitely opposed to legislation of this character.

The Public Affairs Committee of the California Division of the American Association of Engineers concludes a discussion of the proposed law as follows: "As the matter now stands the proposal of a specific license bill by the American Association of Engineers has indicated the general sentiment throughout the state as favorable and whether or not the movement is successful at this session of the legislature, the foundation has been broadened for final success in 1925. Disregarding the merits or demerits of licensing, the movement is growing and has acquired momentum throughout the United States. A majority of engineers favor it where its working is fully understood. There are now twenty-one states with license laws on the statute books, including both Oregon and Arizona. The force of circumstances may thus be

the most effective element to bring about the passage of the law in this state, for of those few California engineers who now strongly oppose it, many practice in adjoining states, and rather than submit to the inconvenience of qualifying under the laws of other states they will prefer coming under a license law in California containing a provision for reciprocity between states as does the proposed bill."

Licensing laws are being advocated in other western states at the present time. It is probable that agitation in favor of legislation of this type will increase as the years go on. Certainly it will prove an absorbing topic of discussion in the various western engineering groups.

Development of Colorado River Held Up by Arizona and Colorado

BY FAILURE to secure ratification by the legislatures of Arizona and Colorado, the Colorado River Treaty between the seven states tributary to that waterway, has been rejected. No permits for development of the Colorado will be issued by the Federal Power Commission until the pact has been approved, nor can Congress take any official action. The development of the Colorado River has been effectually and indefinitely arrested.

The Colorado River Treaty is a comprehensive workable plan for a systematic and far-reaching control of this great waterway. The treaty is at best a compromise, but all treaties are essentially compromises. Each of the contracting parties has made concessions. No arrangement can be made permanent if it is for the selfish interest of one side or the other. It is to be hoped that sufficient public interest will be aroused in the imperative need, that steps be immediately taken to harness the Colorado, that the recalcitrant legislators will be awakened to their selfishness.

Machinery Exports to Asia Increase Seven Fold in Past Five Years

DESPITE a strict curtailment in most lines since the war, exports of machinery to the far East have increased seven fold in five years, with every indication of continued rapid expansion. This somewhat startling report is revealed in an exhaustive summary of machinery markets in Asia recently issued by the Department of Commerce. Asia is rapidly developing in importance as a market for American machinery, having absorbed nearly $242,000,000 worth of such equipment in the last four years; a quantity that would not have been absorbed in four decades at the pre-war rates.

Such a volume of modern factory, mining, railway and construction equipment in the hands of the teeming populations of Asia releases forces that are difficult to appreciate but which will undoubtedly seriously affect the history of the world during the next few decades. Furthermore, a movement of this character once started carries itself forward of its own momentum. Japan has shown us what is to be expected under such circumstances. At the present time when looking abroad the eyes of our people almost always turn toward Europe; they should be warned to watch Asia.

The importance of export trade to the average Pacific Coast manufacturer is increasing very rapidly. It was not many years ago that the domestic market absorbed easily almost all the domestic production, and the rapid development of the home territory provided a satisfactory increase in the domestic demand. This situation is changing, and year by year it is becoming more necessary to cultivate outside markets if business is to show a satisfactory expansion.

On the whole, it appears that American manufacturers can expect to export to Asia during the next few years an average of $40,000,000 to $50,000,000 worth of industrial machinery, and foreign sales managers will presumably be justified in developing their organizations to correspond to this basis. With the exception of Great Britain, there is no country other than the United States which exports anything like the amount of machinery indicated by the foregoing figures, and it does not seem probable that foreign competition will disturb the trade to any serious degree.

Washington Utilities Face State Ownership Problem

AS A result of a bitter political fight in the state legislature in Washington relative to the taxing of municipally owned power plants and the sale of power by municipalities outside of city limits, a state ownership bill seems imminent at the next election. Both the power companies and the municipal officials who have been contending over the extension of municipal power lines will undoubtedly oppose a state ownership proposal, should such be advanced. It is regrettable that the logical and orderly development of the hydroelectric resources of the western states cannot proceed without the constant hampering of political interference.

Hydroelectric Development Presages Continued Prosperity in West

EVIDENCE that the rapid and unimpeded development of the hydroelectric resources of the West is proceeding upon schedule is apparent in important announcements appearing elsewhere in this issue. Work is already under way to add the third unit of 22,000-kw. capacity to the Caribou plant of the Great Western Power Company. Bids have been called for by the city of Seattle for the construction of 100 miles of 165,000-v. transmission from the Gorge Creek plant on the Skagit River to Seattle, and the Pacific Gas & Electric Company has announced that work will begin within the month to develop an additional 100,000 hp. on the Pit River, by the construction of Pit No. 3 plant.

Translated into dollars of industrial development this means a continually expanding market for all classes of electrical apparatus, appliances and supplies.

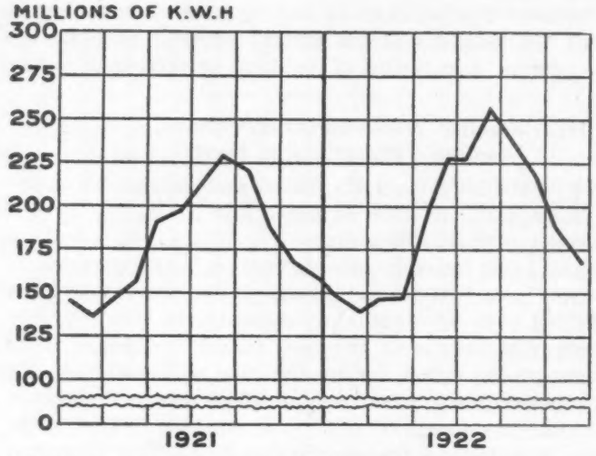
CURRENT COMMENT

Power Demand in West Is Increasing

Seasonal decreases in the use of electric power for industrial purposes were smaller than usual for December, 1922, in the Twelfth Federal Reserve District and the total sales of 20 of the principal companies in the district were 20.6 per cent greater than during December, 1921, according to the current report of the Federal Reserve Agent. An increased demand for electric power compared with a year ago was reported for all of the major industries of the district except agriculture. The abundant rains of the present winter are credited with being largely responsible for the decline in agricultural consumption of electric energy. Sales of power for industrial purposes by certain industries and by sections of the Twelfth District are compared in the following percentage table:

	Agriculture	Mining	Manufacturing	Total Industrial Sales
California	—43.2	— 1.9	+32.8	+ 8.7
Pacific Northwest	+28.0	+12.8	+19.5	+27.9
Intermountain	—21.9	+58.0	+40.6	+83.5
Twelfth District	—42.3	+ 6.8	+29.6	+20.6

Compared with November, 1922, total industrial sales of power during December were less by 5.1 per cent. There were seasonal declines in the demand of the agricultural, lumbering and manufacturing industries. In the accompanying chart are shown the total industrial sales of eight California power companies during 1921 and 1922, as reported to the Federal Reserve Bank.



Total industrial sales in kw-hr. for eight California power companies for 1921-22 as reported to the Twelfth District Federal Reserve Bank.

Figures showing the number of industrial consumers and industrial sales during December, 1921, and December, 1922, follow:

	Industrial Consumers Dec., 1922	Industrial Consumers Dec., 1921	Industrial Sales, Kw-hr. Dec., 1922	Industrial Sales, Kw-hr. Dec., 1921
California	58,100	48,046	174,281,634	160,212,857
Pacific Northwest	11,029	10,266	77,898,863	60,903,336
Intermountain States	10,036	9,743	42,532,384	23,166,257
Twelfth District	79,165	68,055	294,712,881	244,282,450

It is upon a growth such as that indicated in the above table that the western utility companies are basing their development programs which call for an addition to the generating capacity of approximately 10 per cent each year.

Poultry Industry Offers Use for Electric Light

The use of artificial light—in this case, electricity—in poultry houses in the rural districts to increase winter egg production has become so important in California and other sections of the West that a series of exhaustive tests have been conducted at the University of California Agricultural Experiment Station at Davis, Calif. The tests have been made the subject of a bulletin which has just been issued by the College of Agriculture of that institution. So important is the poultry industry in certain sections of California that considerable load can be built up by central stations and profitable business secured by the contractor who makes a specialty of catering to the poultryman. The results of the tests made by the University of California should provide strong arguments both for the contractor and lighting salesman.

The use of artificial lighting in poultry houses was first employed on the assumption that fowls do not require more hours of rest in winter than in summer and that if artificial lighting were used in winter to produce similar conditions of daylight and darkness as exist in spring and summer, increased production ought to result. Investigations conducted at the station proved that winter egg production can be increased as high as fifty to sixty per cent by artificial lighting. The fact that eggs are higher in price during the winter months and that added production at that time means increased monetary return is further argument for the installation of lights.

Tests have shown that one 25-watt lamp equipped with a good metal reflector is sufficient to

properly light 60 sq. ft. of floor space. Lights should be hung 6½ ft. from the floor.

In California the use of artificial light should be begun in October and discontinued in March. It has been found best to use the artificial light in the mornings, turning the lights on at a time which will provide a 14-hr. working day for the hens. Use of morning lighting alone does away with the necessity of dimming which must be done at night to imitate the approach of darkness.

Electrical manufacturers have already begun to realize the importance of this new application of electricity and recently there has been placed on the market a simple and cheap time switch for turning on the lights at an early morning hour. The circular issued by the University of California contains a working drawing of a simple switch which may be made up in the shop at a slight cost.

It is certain that there are many arguments in favor of this type of load. It is one that can be seriously considered by both central station and contractor.

Opportunity for Electric Heat in Foreign Markets

While no statistics exist upon which to base the actual possibilities for modern electrical cooking and heating equipment abroad, conditions in certain foreign countries appear to be favorable enough to warrant more aggressive action on the part of manufacturers of commercial baking ovens and of heating equipment for industrial purposes, according to reports from the Department of Commerce. In many countries, which are dependent upon foreign coal and oil supplies, the cost of fuel is high and there has been limited development of artificial-gas systems, which would normally cater to that class of load.

In certain of these countries, such as Switzerland, Norway, Sweden, Spain, Italy, and Brazil, where coal is expensive, the water-power resources are abundant and the extensive development of these resources has resulted in a low cost of electric service, which makes the use of electric cooking and of industrial heating economically feasible.

In many of these countries it is believed that baking ovens of the revolving type can be introduced into many of the better-class bakeries, if aggressive selling methods are adopted. Standards of sanitation are rising the world over and this fact, coupled with favorable prices for electric energy and the very unique advertising value of modern revolving electric ovens, especially if installed so as to be accessible to the public, should open a broadening field for such equipment. Along with the electric oven of this type other electrically driven equipment, specially developed for baking establishments in recent years, should find an increasing sale.

Heating equipment installed for special industrial processes has apparently had little attention in foreign countries, but the recognized efficiency of such installations should result in their being adopted in many industrial operations abroad if properly presented.

Some time ago tea planters in Ceylon expressed interest in the application of electric heat to the curing of tea leaves—an idea which is typical of the many possible developments for electric heating awaiting solution by our manufacturers who specialize in industrial heating equipment. Likewise, the application of electric heating for baking the enameled finish of manufactured articles, as developed to a considerable extent in the automobile industry, should find a promising field in manufacturing countries where electric power is available at a reasonable price per kilowatt-hour.

Manufacturers, however, must bear in mind the fact that the economics of electric ovens and the application of electricity to industrial use are none too well appreciated by business men, even in this country, and are still less known abroad. For that reason it will be necessary to make aggressive efforts to develop business in foreign markets and manufacturers must have representatives who have a thorough knowledge of the technical and commercial features of the products they are to sell, combined with a full knowledge of the processes to which they propose to apply the new equpipment. Conditions, however, are favorable, and if the right kind of agents are secured, there is no doubt that a fair amount of business can be built up.

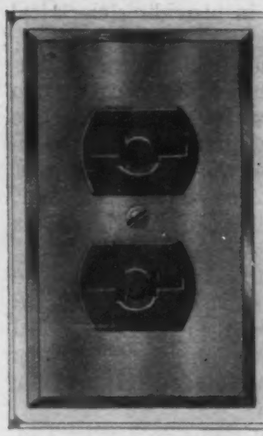
Daily Production of Electricity Breaks Records

For the sixth time since May, 1922, the average daily production of electricity by public utility power plants has broken all records, according to figures compiled by the United States Geological Survey showing that December production is slightly in excess of that for any month in the history of the utilities. The increase, however, over the revised figures for November, 1922, was small, showing that the seasonal decrease which usually occurs around the first of the year apparently started in December. The average daily output for December was 147,600,000 kw-hr., while that for November was 147,000,000 kw-hr. The month-by-month output for the year follows:

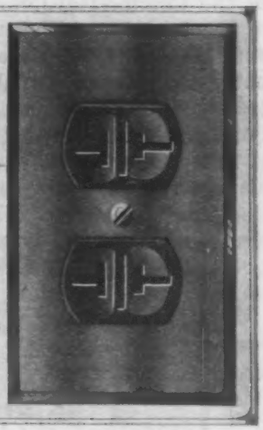
Month—	Kw-hr.
January	122,900,000
February	123,900,000
March	123,300,000
April	120,000,000
May	123,400,000
June	127,900,000
July	124,900,000
August	131,400,000
September	135,000,000
October	139,800,000
November	147,000,000
December	147,600,000

The average daily production for the year was 130,600,000 kw-hr. The increase which has occurred during the past year can be taken as indicative both of the general resumption of industrial activity and the increasing use of electricity for power purposes.

THE interior of an open hearth steel furnace (center) seen through the colored glasses of the operators of the San Francisco plant of the Pacific Coast Steel Company. From this molten metal, which is heated to 3200 degrees Fahr., the galvanized steel transmission towers, shown in the inset, are made.



PLACING ELECTRICAL CONVENIENCE OUTLETS IN EVERY ROOM



by Garnett Young

IN THE fall of 1919, a paper was prepared by a subcommittee and later adopted and presented by the Commercial Committee of the National Electric Light Association, Pacific Section, which brought up for cooperative handling, by the united industry in California, the subject of complete wiring of the home. This paper, the title of which was, "How the Electrical Industry Should Cooperate with the Architect and Home Builder," made it perfectly clear that the future development of the domestic application of electricity rests chiefly upon a single contingent factor of economic bearing, that is, convenient service to the consumer. It was further decided that this desired element of convenience could be attained only through educating the public to an acquaintance with and liberal use of the flush receptacle as an outstanding feature of household wiring installations.

It was demonstrated that the responsibility for inadequate home wiring could not be laid to the architect and builder, but to the electrical industry itself, guilty of unsound sales propaganda, and that, in seeking a remedy, it was up to the industry to undo its own mischief and set the public straight. In such an educational task the major efforts had to be aimed directly to the people but, of course, supplemented by such assistance as might be obtained from architects, builders and other mediums. With these conclusions accepted as a foundation premise, the paper proceeded with specific suggestions as to methods of attacking the problem, which was, after all, to sell the electrical idea to the public. The recommendations made, including the specific recommendation that the California Electrical Cooperative Campaign be charged with carrying out the educational program, and to that end, be equipped with funds and additional facilities to make this possible, were endorsed by the Executive Committee of the Pacific Section. Thus, action was gotten under way several months in advance of the ultimate appearance of the paper on the convention floor in Pasadena on May 19, 1920.

THE California Electrical Cooperative Campaign has received national recognition for its activities in establishing the term "Convenience Outlet." The educational program it has followed since 1920 in bringing before the industry recognition of the fundamental importance of increasing the number of electrical outlets per home is current history. The electrical industry now realizes that its prosperity is predicated upon the domestic use of electricity, and the Campaign can take due credit for its share in bringing this about. But the obvious is apt to be overlooked. The accompanying survey of the "Convenience Outlet" Campaign will prove interesting reading to every member of the electrical industry in the West. In the three short years it has been under way the number of outlets installed in the new homes in California has increased from one per home to one per room!

The Cooperative Campaign accepted the responsibility and started to work early in 1920, inviting to its meetings a number of individuals particularly interested. "An Outlet for Every Appliance" was the slogan adopted within the industry as most fittingly measuring the ambition of the movement. The movement itself was deemed to have uncovered a vital fundamental, namely, that the flush receptacle, in both the physical and commercial sense, is virtually the "neck of the bottle," through which must flow the current that provides home service, while, at the same time constituting the connecting link between electricity and the billions of dollars of trade for manufacturer, jobber and retailer that follows in the wake of its domestic adaptation. "Convenience Outlet," possibly not a new term, was selected as the best and most appealing designation under which to put forward the flush receptacle to the public and, ever since, the home wiring drive has been known as the "Convenience Outlet" Campaign, with various forms of publicity playing up that phrase.

Among the first steps taken was the publication

of the Commercial Committee paper in the Journal of Electricity and The Architect and Engineer, with suitable illustrations and wiring diagrams, reprints being distributed to all architects, builders, contractor-dealers, jobbers, manufacturers, etc., in California.

Beginning in January, 1920, a special representative was employed to interview and interest architects and builders. It was not long before this

Adobe Electrical Home
Equipped With Every Electrical Convenience
Open for Your Inspection
January 20th. to February 13th. 1921
Every Day 2.00 P.M. To 10.00 P.M.
Location: Larchmont Boulevard at Second Street
In
Windsor Square
The New Development

Illustrations such as this appeared in the book prepared by the California Electrical Cooperative Campaign to permit other sections to benefit from the experiences of the Los Angeles Electric Home.

representative found it necessary to extend his sphere to cover the realty people, engaged in subdividing tracts for new residences. He then undertook the task of selling the electrical idea to all of these allies in home construction.

Contact with a group of subdividers led to the happy inspiration of the "Modern Electrical Home," a rather expensive innovation, but easily justified by the potential possibilities for direct and effective publicity. This experiment was first tried out in San Francisco with such signal success as to induce repetition in Oakland, Sacramento and Los Angeles, two homes having been displayed in the last named city. These homes were inspected by approximately 136,000 visitors and it cannot be doubted that substantial numbers of them were interested and not merely curious. Demonstrators in charge of the homes supplied all visitors with copies of the attractive pamphlets and wiring diagrams, telling the story of Electrical Home service. The same demonstrators talking with the guests placed emphasis on the "Convenience Outlet" as the means to the accomplishment.

In smaller towns, where "Electrical Homes" were not practical, the Campaign promoted the idea through exhibits at county fairs. This was done by means of dealers cooperating in providing electrical exhibits for these occasions.

During the year 1920, supplementary distribution was made of approximately 2,500 each of two different booklets secured from the National Electric Light Association, eastern headquarters, these booklets illustrating and describing the arrangement of a modern electrified home. Also during the year, 10,000 copies of the original small size wiring plans were distributed, in addition to repeated publications of it in various newspapers in connection wth the combinational electrical pages then in vogue. Toward the close of the year, the modified and improved home-wiring plan was gotten out and 50,000 copies printed. Enlarged prints were made and sold for display purposes.

In May, 1920, a paper entitled "Possibilities of the Convenience Outlet Campaign" was presented to the annual convention of the National Electrical Supply Jobbers' Association at Del Monte, Calif.

Activities for the year 1921 were opened up with the advent of the second "Electrical Home" in Los Angeles, this being the famous adobe home, the most pretentious and successful of all the homes

To attract the people of San Francisco to the first "Electrical Home" displayed there, the Campaign prepared a brightly colored card which was displayed in the windows of all the local electrical dealers.

exhibited. It remained open for 25 days and was inspected by 57,000 visitors.

The unprecedented success of this adobe home exhibit, and the wide publicity incident thereto, brought requests for information for particulars from all parts of the country. The Campaign concluded to prepare a history of the electrical home movement to serve as a guide for future activities

of this kind, not only in California but elsewhere. This book was fully illustrated and 300 copies of it were sold.

To further capitalize on the adobe home, a motion picture was made of it, and two copies of this film were sent over the picture circuits of California, showing to 184,000 people. A slide showing

The Oakland Electric Club in cooperation with the Campaign staff exhibited this "Electrical Home" which was an eight-room structure having thirty-eight "Convenience Outlets."

a "Convenience Outlet" in use was later shown to audiences, totaling 318,000.

A still further effort to attain saturation with publicity on the "Electrical Home," and especially in the rural districts, was a series of eight illustrated stories run in 41 newspapers of the state, with a circulation of 323,000. The amount of newspaper space represented in this publicity was 10,480 in.

An appeal, over the signature of the Advisory Committee of the Campaign, was made to manufacturers and other national advertisers connected with the electrical industry, to include in all of their copy small cuts of the "Convenience Outlet" associated with some suitable clause as, "Wire the Home Complete for the Convenient Use of Electrical Labor-Saving Appliances."

A Plan to Interest the Contractor-Dealers

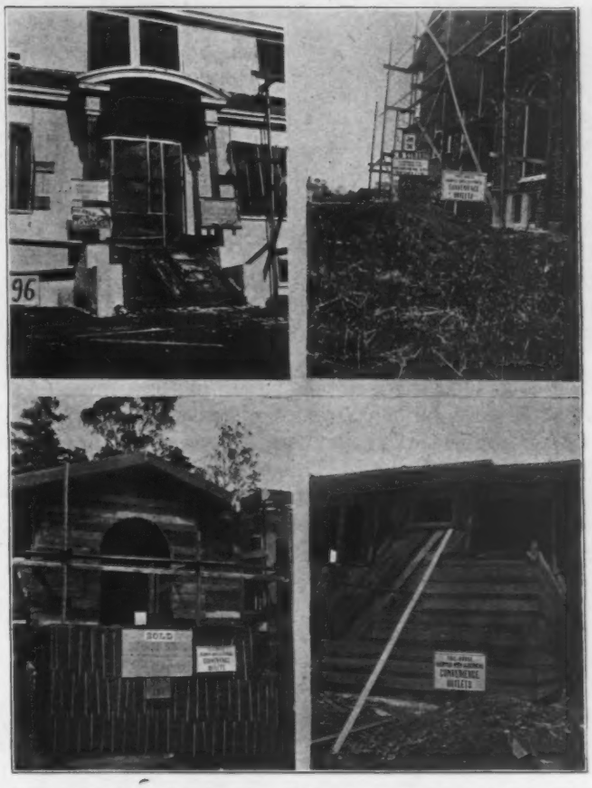
In order to tie-in the contractor and dealer with the drive on "Convenience Outlets," a Campaign member appeared before the Oakland meeting of the California State Association of Contractors and Dealers and made a talk to put over the self-interest factor, proving to these salesmen of the industry that their best interests were parallel to the advancement of the "Convenience Outlet."

At the Los Angeles Industrial and Trade Exposition, the Campaign arranged an electrical exhibit, demonstrating clearly the uses of "Convenience Outlets" for utility appliances. This affair was attended by 302,000 visitors and an extensive distribution was made of the booklet, "Comforts and Conveniences of Electricity in the Home."

The Campaign had printed a quantity of placards, which were easily readable from the street, these to be placed upon properly wired homes. This notice read, "This Home is Wired Throughout with Electrical Convenience Outlets."

In September was held the first of a series of "Architects, Builders and Realtors' Days," using the electric clubs as a medium. This first meeting was before the Oakland Electric Club, the attendance being 140, of which half the number were visiting architects, builders and subdividers. A Campaign member made a talk on proper wiring of homes, emphasizing the convenience outlet as the pivot of this accomplishment. Similar meetings supplemented by playlets were held by the Los Angeles and San Diego Electric Clubs.

In October, 1921, a Campaign member made a trip East and was delegated to call upon the leading wiring device manufacturers and urge them to adopt the term "Convenience Outlet" (in place of the old designation—flush receptacle) in all of their advertising, carton labels, shipping marks, catalogs, etc. This appeal was successfully made with the desired results coming into effect a few months later.



Homes under construction in which one or more "Convenience Outlets" were installed in each room, were supplied with cards stating, "This house equipped with 'Electrical Convenience Outlets.'" Home buyers began to look for these placards.

Cooperation was also secured from national electrical societies and publications.

During November there was held in San Francisco a California Industries Exposition, and the Campaign saw to it that the domestic science exhibit of the San Francisco Public Schools included a complete electrical kitchen featuring "Convenience Outlets." This exposition was attended by many thousands of visitors.

During December, 25,000 copies were made of a new and much improved wiring plan on which the Campaign had been working for several months. The plan was in the form of a four-page folder, part of which was devoted to interior views of different rooms with the walls cut away, revealing all of the furniture and electrical equipment in place to conform to the wiring provided in the accompanying diagram. Distribution was immediately started to all architects, builders and subdividers, electrical contractors and dealers throughout California, and a supplementary supply was sent out to the sales organizations of electrical jobbers and manufacturers, as well as the district offices of power companies. A series of bulletins and window cards were also printed. One thousand additional quarter cards for placarding properly wired homes were printed in order to continue the practice described, this having been found a very effective means of forcing the hands of builders and subdividers on the installation of "Convenience Outlets."

The New Wiring Plan of the Campaign

During December an essay contest was conducted by the San Francisco Bulletin and the Los Angeles Evening Express on the subject, "Why Is Electricity the Modern Servant in the American Home?" Some 1,700 essays were submitted as a result of the almost continuous publicity given to the contests by these two papers. Prizes were awarded in the nature of electrical squipment for the home. The last activity of the year was a meeting of united sales organizations called by a Campaign member to increase the self-interest of electrical salesmen in the "Convenience Outlet" drive.

Throughout the year 1921, the Campaign field men continued the practice, begun in 1920, of calling on architects, builders, realtors, owners, subdividers, etc., in support of proper home wiring based on the "Convenience Outlet." This was a daily procedure and results were made apparent through the improvement of electrical specifications coming from architects' offices and through the decided increase in the number of "Convenience Outlets" installed. Surveys made in various tracts at the close of the year reveal an average of six convenience outlets per home. On other surveys made among apartment houses, almost all of them had at least one "Convenience Outlet" in each room, while many of them had two. Surveys made among new office buildings and hotels gave the same results as apartment houses.

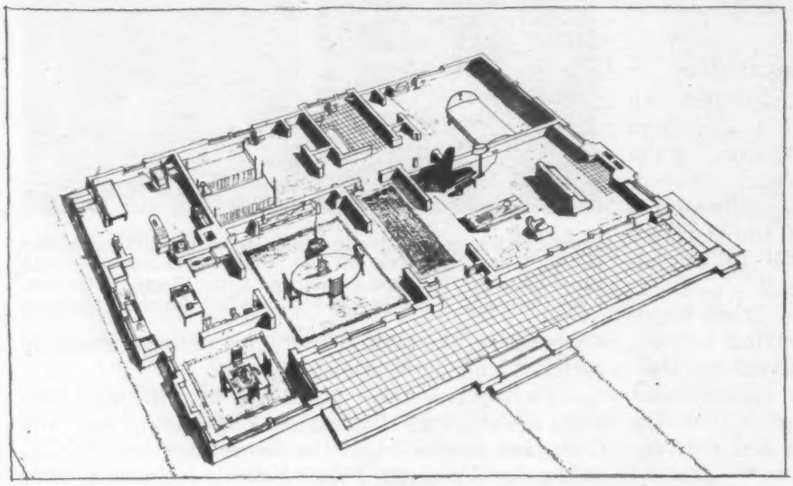
The year 1922 was started off with a follow-up to the meeting of united sales organizations. This follow-up consisted of a written appeal to the sales managers of manufacturing, jobbing and power companies to encourage their salesmen to lend a hand in their daily contact with electrical contractors and home builders in promoting the "Convenience Outlet" idea. The state associations of contractors and dealers were also urged to support the drive.

In Opposition to Open Contact Receptacles

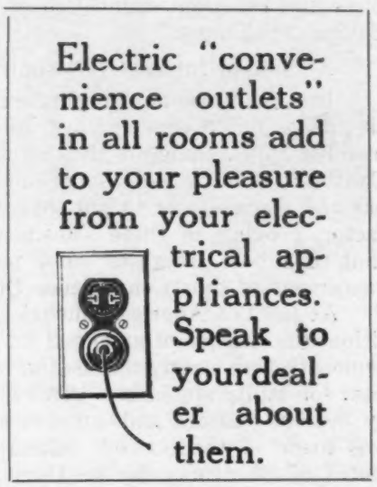
The Campaign staff was put to work in earnest opposing flush receptacles with open contacts or lacking the interchangeable feature of the standardized type. This fight was carried to the departments of electricity of the leading cities in the state and considerable encouragement received.

The Campaign arranged a suitable electrical exhibit in the "Architects and Builders Exposition" held at Stockton during January, this exhibit providing a demonstration of "Convenience Outlets," electrical appliances and ranges, etc.

In February the Campaign ordered 1,000 "Convenience Outlet" counter cards, these cards being an exact reproduction in actual size of the standardized type of "Convenience Outlet" and plate. The cards were lithographed and embossed, while the T-slots were punched through the cards, thus making it possible to insert a plug cap. Arrangements were made for distribution of this counter card to all architects and builders, while one was placed upon the counter of every contractor and dealer and in all district sales offices of the power companies.



The Campaign issued a four-page booklet and on one of the pages this drawing of a cut-in section of a modern home was displayed, showing a practical electrical installation. The furnishings showed how the home would look occupied.


Electric "convenience outlets" in all rooms add to your pleasure from your electrical appliances. Speak to your dealer about them.

One electrical manufacturer distributed this placard to aid in establishing the new designation "Convenience Outlet."

During this month the Campaign arranged for the proper wiring and electrification of the prize bungalow of the San Francisco Chronicle, donated to the winner of the new subscribers' contest. For a period of two months prior to the close of this contest, this model bungalow and the electrical features received almost continuous publicity in the columns of the newspaper.

In March the Architects, Builders and Realtors' Days were resumed with a huge meeting through the medium of the San Francisco Electrical Development League, the attendance reaching 406 and including 170 architects, builders and subdividers invited for the occasion. A few days later the San Diego Club arranged a similar meeting.

The window display of the H. L. Miller Company of Pasadena, Calif., won first prize in the contest held by the California Electrical Cooperative Campaign in conjunction with the June Bride Week held June 5-10, 1922.

In April, a Campaign member appeared before the Retail Salesmen's School, conducted under the auspices of the Educational Committee of the Campaign, and rendered a brief history of the development and progress of the "Convenience Outlet" idea, emphasizing the practical value of this movement of the dealers and, by means of samples at hand, demonstrated the contrast between the standardized "Convenience Outlet" and its long list of predecessors.

On May 1, the city of Los Angeles put into effect its ruling prohibiting the use of any flush receptacle lacking the feature of concealed contacts, while bolding demanding the exclusive use of "Convenience Outlets" with concealed contacts, and making detailed provisions for special "Convenience Outlet" circuits in homes and stores.

"June Bride Week" was the next event on the calendar, this involving many different statewide efforts to focus the attention of the public upon electrical appliances for the home and proper wiring to serve them. One feature was a message broadcasted over the radio by President Browne of the State Contractor-Dealers' Association, explaining the happiness and comforts to be derived from the truly electrical home and how this could only be brought about through proper wiring with a liberal use of "Convenience Outlets."

During July, a Campaign member appeared before the new business superintendents of the Pacific Gas & Electric Company and delivered a short talk in an attempt to prove the value of the "Convenience Outlet" as a revenue producer for the power companies. During the month the entire industry in the state was notified that standardized "Convenience Outlets" were available and the men in the business were urged to use the name at all times.

Later in the month a survey was taken among members of the San Francisco Electrical Development League with the object of developing the relationship of the "Convenience Outlet" to the use of electrical appliances in the homes of those reporting. The results of this survey revealed that "Convenience Outlets" and electrical appliances were consistent running mates.

During this month a written appeal was made to the Associated Manufacturers of Electrical Supplies to see to it that their member manufacturers gave proper recognition to the "Convenience Outlet" in their national advertising. This appeal from the Campaign was supplemented by an appeal of individual local members of this institution and also by an appeal from the contractor-dealers' association of California.

In August, the cities of San Francisco and Oakland, followed the lead of Los Angeles, in that the department of electricity of each place put into effect a ruling forbidding the use of flush receptacles which lacked the concealed contact feature. These rules require the use of "Convenience Outlets" with concealed contacts.

At this time, the Pacific Gas & Electric Company, cooperating with the home wiring drive, ran

"Convenience Outlet" advertisements in 280 newspapers of the northern part of California. Concurrently, the Southern California Edison Company ran similar advertisements in 141 newspapers of the southern part of the state.

During August the Campaign got under way a drive, which extended through September, in which 80 men were pledged by San Francisco and Oakland manufacturers, jobbers and power companies to make a total of 240 calls on residential tracts for the purpose of selling the "Convenience Outlet" idea to the tract salesmen. This was to be done incognito, the representatives appearing in the role of prospective home buyers and, in the language of the layman, demanding sufficient electrical outlets.

The Los Angeles Industrial Exposition, running from Aug. 25 to Sept. 9, carried an electrical section and "Convenience Outlets" were featured in almost all of the individual electrical exhibits which made up the section. They were also installed freely in a model kitchen and breakfast room in the building material section. This model kitchen was visited by almost 100,000 people.

The Campaign worked with the "Complete Homes Exposition" staged in the Lakeshore Highlands district, Oakland, from Sept. 28 to Oct. 16. One of the ten homes exhibited was known as "The Electrical Home," the wiring of which was supervised by the local Campaign staff and includes a total of 71 outlets, of which 21 are "Convenience Outlets" for appliances and five "Convenience Outlets" for heating equipment, one outlet for a water heater and one for an electric range. The balance of the outlets are for lights and switches. The special advertising of this electrical home was in the name of the Oakland Electric Club. This electrical home secured a great amount of publicity for proper home wiring and, particularly, convenience outlets. The California Industries Exposition was presented in San Francisco in October and the local Campaign staff aided electrical exhibitors in featuring convenience outlets in their respective displays.

Representatives of the Campaign continued the work of advising architects, builders and realtors throughout the year and during the year 20,000 copies of the wiring plan devised by the Campaign, were distributed. Usually the plan was accompanied by a copy of "Electrical Specifications for Residence Wiring." This contained all necessary data for the complete wiring system in the modern home. As a result of the personal calls of the Campaign representatives, frequent telephone calls from architects for assistance with wiring plans were received during the year. An average of one call a week was received from architects for this assistance. In each instance when plans were delivered and fully explained, assurance was given that the wiring would be done accordingly.

During 1922, the Campaign staff maintained a perpetual running survey among new tracts and the data secured shows that the direct results accruing from the activities of the staff are not theoretical, but practical and concrete. A survey made by the Campaign brings out the fact that in 933 homes inspected in various parts of California, there were 5,071 rooms, and the total number of lighting outlets was 19,494. These houses contained 10,224 switch outlets and 5,961 "Convenience Outlets." These figures show an average of 6.4 "Convenience Outlets" per home and an average of 1.2 "Convenience Outlets" per room. The results from the work are very satisfactory, for two and one-half to three years ago the average new home contained but one "Convenience Outlet."

Albuquerque Electric Company Serves Rapidly Growing Territory

TO ONE who travels from Denver, Colo., to El Paso, Tex., Albuquerque, N. M., leaves the impression of an oasis on the arid plains of New Mexico, thriving and bustling with agriculture and industry, and to the easterner who journeys to the West, via the California Limited on the Santa Fe, Albuquerque conveys the first vivid impression of western civilization. Quite unlike its neighboring city, Santa Fe, with its quaint adobe buildings and narrow streets and its historical setting, Albuquerque is a modern western city with wide streets lined with shade trees and many beautiful residences and business buildings. The traveler who alights from the train, is impressed by the extensive and elaborate Indian curio store conducted at the station, and by the many Indian squaws who are seated on the platform ready to sell their wares to any who will buy.

This rapidly growing territory, with a population of about 30,000, is served by the Albuquerque Gas & Electric Company. Characteristic of power companies of the West, the company is enjoying a steady and normal increase in business, 4,800 electric consumers in the city and surrounding territory now being supplied by it. During the past seven years the load on the system and the number of customers has more than doubled, and during the last two years 1,300 new consumers have been secured by the company. Based on the new business obtained during January of this year, the number of electric consumers will be increased by more than 1,000 during 1923. To meet the increasing demand for lighting and power service, the company has just completed the installation of a 2,500-kva. turbo-generator at a cost of approximately $100,000. In addition to this, a like amount was spent in 1922 on improvements and extensions to the transmission and distribution systems.

Albuquerque is one of the most progressive cities in this region and is at the present making

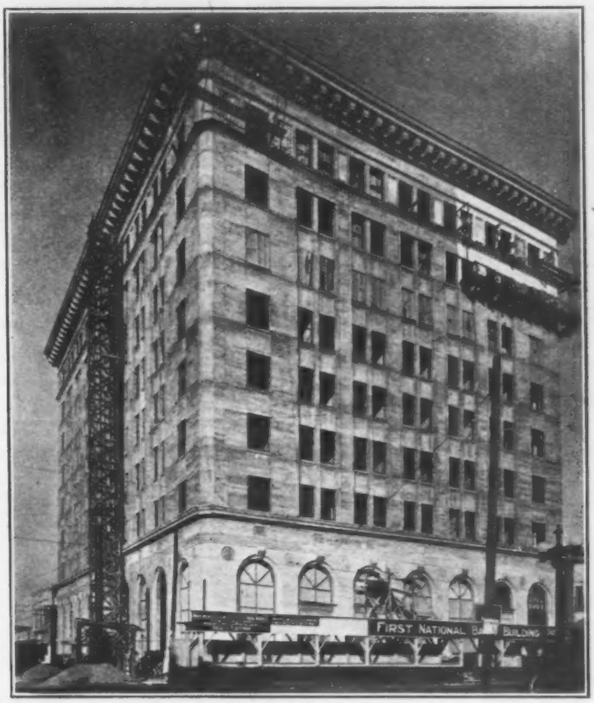
Exterior of the Alvarado Hotel at Albuquerque, N. M., The city of Albuquerque presents to the easterner his first view of western civilization. The wares of the Indian squaws may be noticed in the center foreground.

rapid strides in its development, both architecturally and commercially. The accompanying photographs show some of the important building construction now under way. Perhaps the most imposing structure being built is the First National Bank Building, an eight-story stone bank and office building, which will cost when completed in the neighborhood of $600,000. To take care of the transient visitors to the city, a syndicate of Albuquerque business men is erecting a beautiful modern hotel of the Spanish type architecture at a cost of $350,000. This hotel will contain 164 rooms and will be completed and ready for occupancy in the near future. Extensive improvements costing $300,000 on the Alvarado Hotel, one of the chain of hotels on the Santa Fe, under the management of Fred Harvey, have just been completed and as a result the capacity of the hostelry has been doubled.

An expansion program for the large shops of the Santa Fe Railway system, located at Albuquerque, is under way and should be completed within a month. This development comes as an addition to a modern machine shop which was completed during the past year at a cost for buildings and equipment of about $3,000,000. Extensive additions and improvements to the boiler house are being made at the present time and when these are completed will have entailed an outlay of approximately $100,000. The Santa Fe shops have the largest industrial payroll in the city, as they normally employ about 1,500 men. These men are all residents of Albuquerque and are good customers of the local stores.

Albuquerque, unlike many cities in the intermountain region to the north, and other cities to the south, is not supported by coal or metal mining. This is despite the fact that the only anthracite coal mines in the territory are but forty miles away from the city. Albuquerque is the distribution center for the state of New Mexico, serving as it does all of the other cities and towns in the state with its wholesaling facilities. This activity, coupled with the growth of livestock and melons and agriculture in general and industry, has been the contributing factor in the growth of the city. The University of New Mexico and a number of health sanitariums are located there. Among the important industries are flour mills, ice plants, a large sawmill, planing mill and sash and door factory.

Serving this city and its surrounding territory with electricity is the task of the Albuquerque Gas & Electric Company. The company generates all



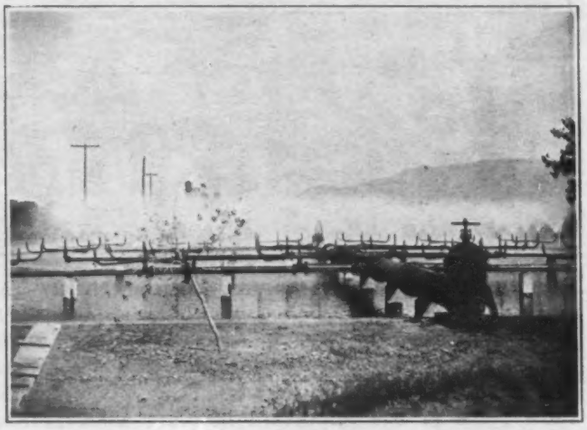
The First National Bank Building will be the largest building in Albuquerque when it is completed. The structure is being built entirely of stone and will be eight stories in height.

power by steam in its own plant. One of the unique features of this steam power plant is the fact that hog fuel or sawmill refuse is burned under some of the boilers for producing steam. This is surprising when it is considered that Albuquerque is located in a region with not the slightest vestige of timber in sight for hundreds of miles. Pine logs are shipped

in by rail, however, to a large sawmill located in the city. Slabs from the logs and other scrap from the mill are run through a hog, a machine with a series of knives, and are ground up into small pieces. This hog fuel, as it is called, is then carried by conveyor to the power plant some 500 ft. away and dumped in the open. It is then loaded into another conveyor as it is required and taken to the boiler room where it is fed directly into the furnaces through chutes without further handling.

The supply of fuel is limited and generally only enough is available to fire two boilers. These boilers are banked in with others under which coal is burned. Many steam power plants throughout the Northwest burn hog fuel extensively, but their fuel is a by-product of mills sawing fir, which does not present the difficult problems in firing that are experienced with refuse from a sawmill operating on pine. One of the great troubles experienced at the Albuquerque plant is that the fuel is frequently so dry and light, in spite of the fact that it is wet down, that it is carried up the stack before complete combustion has taken place. It is not uncommon to have a red hot smoke stack. Better combustion could be obtained in specially designed furnaces but the supply of fuel is uncertain and boilers must be equipped so that they can be thrown over onto coal on short notice.

Water to be used in the condensers of the steam-electric plant is cooled in this 9,000-gal. per min. spray cooling pond.

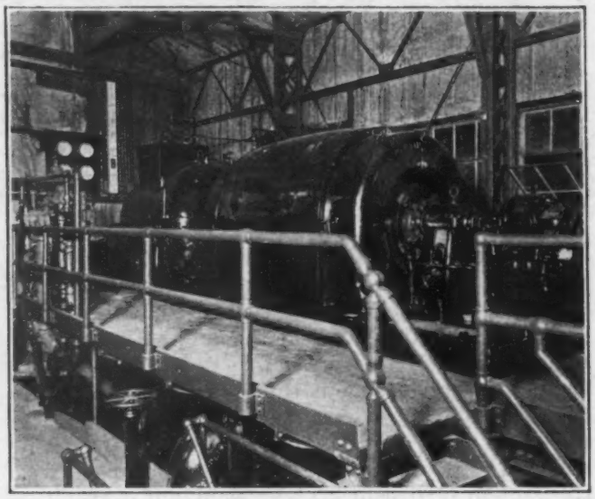


This 164-room modern hotel is being built by a syndicate of Albuquerque business men at a cost of approximately $350,000.

In keeping up the development of its plant, the Albuquerque Gas & Electric Company is planning the installation of several thousand dollars' worth of boiler room recording and testing instruments. The plans call for the purchase and installation of steam flow meters, CO_2 recorders, recording thermometers, etc. This equipment will aid greatly in operating the plant efficiently. One of the difficulties experienced by the company is the securing of sufficient quantities of cool pure water for condensers.

The Albuquerque Gas & Electric Company is owned by the Federal Light & Traction Company of New York City. This holding company owns and operates a number of plants throughout the West. Among these in the state of New Mexico, besides the one at Albuquerque, are the plants located at Las Vegas and Deming.

Interior of fire-box in which hog fuel is being burned. The picture was taken shortly after the fire was lighted. The fire burns only on the outer surface of this cone shaped pile.



New 2,500-kva. turbo-generator installed at the plant of the Albuquerque Gas & Electric Company at a cost of $100,000. The machine operates at 3,600 r.p.m., is rated at 2,300 volts.

Power Earnings and Comparative Public Wealth

By G. B. Herington
Consulting Engineer, Portland, Oregon

THE comparative economics of any large water diversion may well be studied as to its effect on the community by its use applied to either irrigation or power. Mr. Herington points out that wealth created for power operators by returns on investments in power properties bears but a small proportion to the increase in wealth in the community availing itself of the power furnished.

WATER use has accepted generally certain primary obligations: First, the public health, the sustenance of life in the community. This is the highest use and is so affirmed. Second, the production of food for the community through irrigation, and third, the production of power for the conveniences and multifarious needs of the community. These three uses in their order have by common consent been practically written into the law of water use by common custom and usage.

Public opinion has in the past few years been undergoing a decided change relative to power development by private initiative. It has been well shown and amply demonstrated that in the main the large power companies are of most substantial investment character, serving an increasingly vital necessity to many thousands of customers, seeking few public favors except for public service, and rendering a dependable service that becomes so much a matter of course that an interruption of a few minutes appears the more remarkable by its infrequent occurrence. These companies as a class make a rather uniform earning, are restricted as to its amount by public bodies keenly sensitive to public complaint, and in the main have quietly moved into the most substantial and stable class of utility investments, constantly expanding to meet new demands for service.

Some years ago a hysterical era of name calling, muck raking, and political demagoguery dragged into its filthy arena all large corporations and particularly public service corporations, for abuse and vituperation, at least in part, to the end that the authors of the hysteria and these self-seeking prophets of the public weal might reap brief public acclamation. Out of all this slime came many charges, but the power companies had probably fewer charges to defend than most, although we still have echoes of the term "Power trust."

In the name of irrigation much of the best engineering of the age has been directed toward the use of otherwise incompetent lands for the production of food and for the support of an agricultural population. The public wealth of the communities in which waters have been applied intelligently to otherwise useless areas has rapidly and materially increased. Of this much has been said and written and need not be reiterated here. There have been many failures and some sad scandals, but these have been incidental. But the utilization of our great water powers has been so quietly made and has become so much a matter of course, that little has been noted of the general effect and the increase of public wealth concurrent therewith, or of the increasing amount of power use that goes into the daily process and consumption of the average person.

It has become the fashion to quite freely announce and accept the great wealth produced by water applied to irrigation purposes, but little has been said or written of the comparative wealth which may be created by the same water applied to either irrigation or power.

Comparative Values of Power and Irrigation

In California and generally in Washington, the power use comes as an initial application of the water, due to the natural topographical make-up, and after giving off power by its drop, the tailing is used for irrigation on the lands below, these being so situated as to accomplish generally both purposes in an orderly and highly economical way. In Oregon particularly and in other parts of the Northwest and Rocky Mountain region, much land of at least fair irrigable value exists above the main water drops. The main agricultural wealth of the state of Oregon will probably always come from an increasingly effective use of the more ideally situated lower valley lands.

For the purpose of comparatively studying the two sources of wealth the writer recently made a somewhat exhaustive statistical research. It almost immediately became apparent that the wealth created for power operators by returns on investment in power properties, held only a small ratio to that which the use of applied power created in the community availing itself of the power furnished.

By reducing these figures to comparative arbitraries, here quoted only as indices and with a view to bringing the matter into a somewhat empirically concrete and rational form, these certain very general figures were obtained and have been checked out as somewhat fair average values by comparisons in detail as to a very considerable variety of industries making use of electrical power in their processes. An application of some of these figures has a bearing on the matters under discussion herein.

The Productiveness of Irrigation

An irrigation proposal now current for watering 140,000 acres of only moderately good land, calls for

the initial and final use of certain water having otherwise exceptional power potentiality, under a moderate development cost, of about 150,000 hp., all within easy transmission distance of one of our greater Pacific Coast cities.

In the irrigation of this particular land there may be expected as a result:

1. An ultimate net increase of land values above cost, assessments and present values of $50 per acre $7,000,000
2. On complete settlement an annual production above labor costs and above present products, per acre @ $40 ..... $5,600,000
3. An increase of population of, say, one family of 3 per 50 acres, in this case ..8,400 people
4. Or a production in new wealth per supported person of annually ..... $ 666
5. And an increase in estate per person supported on capital value ..... $ 833

The increase of effect in taxable values will largely be absorbed locally for community improvements generated by this new population.

A Parallel Application for Power

In general relation the following figures may be taken as a somewhat approximate general index from the known results of parallel application of power as here related, to a unit of 150,000 hp. by probable investment and use beyond that required in its actual production and distribution; in other words, the public use induced by availability and actual application of offered actual power, may be relatively and for general rational purposes, comparatively stated and deduced as to units of power used, somewhere around the following values:

		Unit of One Applied Hp.
In plant, etc., capital invested for using power	$150,000,000	$1,000.00
In annual payrolls	35,000,000	260.00
In people employed	40,000	.35
In people supported, to be fed and clothed	180,000	1.20
In annual expenditure for raw materials to be manufactured and general overheads	96,000,000	740.00
In annual value of product finally	165,000,000	1,100.00
In profit of manufacture for distribution and partial re-investment	34,000,000	240.00

A study of the general history of the localities surrounding all large offered powers, indicates that within a very short time after the power has become available and on the market, the manufacturing of raw products available is rapidly increased and power-dependent industry accelerated, and the owners of most such powers find themselves seeking a doubling of output within a comparatively short term of years. The Niagara Falls, Keokuk, Southern, Eastern and general California experience all bear this out, while New England's water powers are an index of her industrial activity to a considerable extent.

The comparative economics of any large water diversions may be well studied and compared as to their effect from this standpoint, and a gradual public realization of the ratio of the power investors' earnings to those of the community may well result from continued study of such matters and publication of the results in popular form can only offer added interest on the part of the public.

Greatest Productivity Must Be Secured

Food must be produced, the public be provided therewith at reasonable cost, and the water for public health be conserved, but there must arise a realization of the real potentialities in the latent water power of the country and its best use either by private or public development properly directed to offer the greatest productivity and yield.

Irrigation use in itself offers but one increase in capital and taxable value, then a fairly uniform yield of income from operation.

Power offers a usually safe investment and small percentage reward to its producers, but to the general commonwealth a vastly greater general wealth producing effect.

When the same water can do both services, or still further handle in part a public health use, the general economical development for the greatest benefit of the affected public becomes a reality.

When potential cheap power is fully demobilized at the source through the water being taken for irrigation, which finishes the further potential usefulness of the water within the process of such use, then the land must be of such productivity and potential crop producing power, or the product be so seriously needed as to make such diversion fully a public necessity in the face of the comparative wealth producing activity of the same unit of water for power purposes.

The present situation is in reality that there is no lack of irrigated lands awaiting settlement, but a lack of willing settlers and many irrigated areas of unquestioned merit are but half filled with settlers.

Need for Further Study Apparent

The field of ultimate public power benefits has so far been too little studied and the known economics thereof too narrowly promulgated for the apparent comparative values to be properly known and appreciated, most study so far generally disseminated having been directed toward analysis of the direct earnings from production and distribution alone.

The largest powers are in the West and so far only scratched in their development, but the acceleration of demand is already taxing construction capacity, and with the peculiar combination of manufacturing and marketing possibilities the Pacific Coast offers, they will continue to accelerate in all probability at yet an entirely unforeseeable rate.

Rail Bases Are Destroyed Through Electrolytic Action

THE effect of electrolytic action on rails of an electric railway system presents a serious problem to operating companies. Especially at points where the tracks of the system cross water mains at right angles or are close to the reinforcing steel of large buildings is this action most pronounced.

The accompanying illustration shows the badly damaged condition of 8-in. T-rail bases after 29 years of service on an electric railway system in the West. The electrolytic action was most rapid over the ties; the illustration shows two rails, bottom up, with points where the base rested on the tie marked "T." At these points the rail base had been eaten away, both in width and thickness much more than

Rails showing the effect of electrolytic action. At the points marked "T" where the rail base was in contact with the tie the action was more pronounced than it was on other parts.

at other sections. The part of the line from which these rails were removed was in filled ground which was always wet. The damage was fairly uniform all along a ½-mile length of double track line.

Damage to the rail head and web was comparatively slight, the serious disintegration being confined to the base. These rails were taken out of service on account of the destructive electrolytic action, i.e., neither the wear on the rail head nor the necessity for substituting another rail section would have required the removal of the rails at the time they were taken out of service.

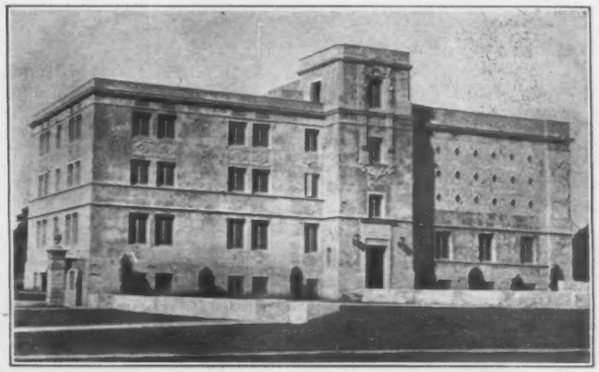
Another unique case of electrolytic action on rails was the case where the tracks of a railway passed close to one of the company's substations. In this case the entire base of the rail has been eaten away.

Two fairly effective means have been employed by street railway companies in overcoming electrolysis. In properly bonded rails, especially of the welded type, electrolysis is very slight. Well drained roadbeds are another means of mitigating the effect. In cases where the tracks cross a group of water mains it has often been found necessary to use artificial drainage on the roadbeds.

New Million-Volt Laboratory Will Serve as Experimental Station

THAT the function of the modern technical college is more than the educating of undergraduate students who come to get the fundamentals of engineering subjects, is a fact admitted by a large proportion of the faculties of the many technical institutions located in the United States. One of the particular functions to be performed by these colleges is the conducting of research work, that the engineering world which these colleges are concerned with may receive new ideas gained from the experiments conducted by the members of the faculty and graduate students enrolled there.

Some time ago the California Institute of Technology of Pasadena, Calif., decided to enter the field



The new million-volt laboratory of the California Institute of Technology will be similar to the Norman Bridge Physics Laboratory, shown above. This building was opened last year.

of electrical research and preparations were made for the erection of a million-volt laboratory in which experiments with high voltage current could be conducted. Dr. Robert A. Millikan, winner of the Edison medal for 1922, will be the director of the laboratory which will be opened about the first of June.

In arranging for this newest laboratory, the Institute secured the aid of the Southern California Edison Company as this company is particularly interested in high-voltage transmission. Previous to the erecting of the million-volt laboratory, the Edison company had been conducting many experiments with its 27-mile testing line which it operated at 240,000 volts. The success of the experiments led to the adoption of the 220,000-volt line which will operate between the Big Creek plants of the company and its Eagle Rock substation.

The new laboratory will provide the Institute and also the engineers of California, with facilities to continue these experiments. The million-volt transformer which will be used in experimental work is one designed by Professor R. W. Sorensen of the Institute and manufactured by the Westinghouse Electric & Manufacturing Company.

This transformer is designed to be installed in four units and the building is so designed that the reinforcement in the structure will act as a metal shield to the transformer.

ELECTRICITY IN INDUSTRY

By Louis F. Leurey
Industrial Electrical Engineer

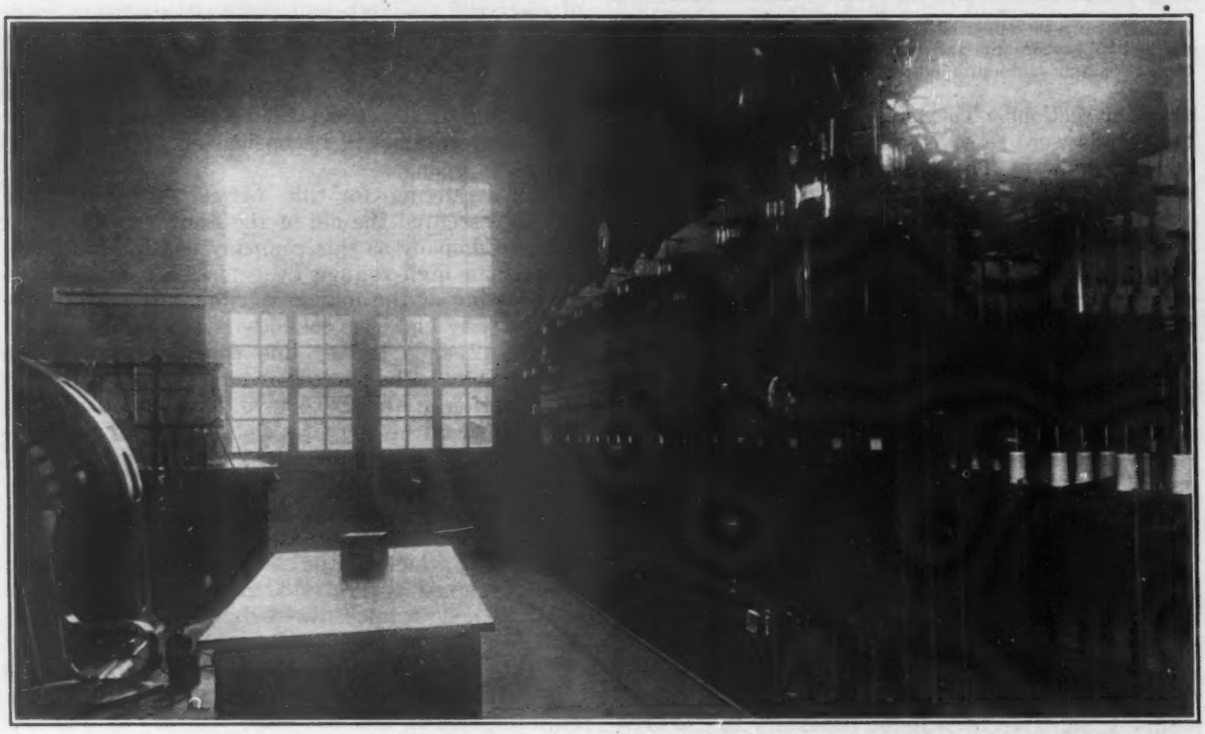
Modern Electrical Installation in Plant of Nevada Gypsum Company

THE Pacific Portland Cement Company of San Francisco, under the direction of W. C. Stevenson, the chief engineer, is now preparing to build a plant for the manufacture of gypsum plaster at Gerlach, Nev. This plant contains a number of interesting electrical features and is a self contained unit including its own central station generating plant.

The generating plant will be located approximately 350 ft. from the group of four industrial buildings and the enclosed plant will consist of three Ingersoll-Rand oil engines driving three General Electric 675-kva. generators to operate at 480 volts, three-phase, 60 cycles. All motors in the plant are for 480-volt operation and consequently no transformation losses occur in the distribution system with the exception of a single line of 300-kva. capacity which is stepped up to 11,000 volts for transmission to the quarry which is five and a half miles distant from the industrial plant.

The main switchboard of the generating plant is designed according to the most advanced practice in industrial boards of this type. The board proper consists of 90-in. slate panels and will be completely equipped with both indicating and recording instruments. Embedded temperature coils in each generator are connected to temperature indicators on the switchboard.

The oil switches are remote mechanically controlled and erected with the busbars on a special pipe frame structure with clear passageways between this structure and the back of the switchboard and between this structure and the rear wall. All instruments on the switchboard will have transformers ahead of their potential coils so that no voltage in excess of 110 volts will exist on the switchboard panels.



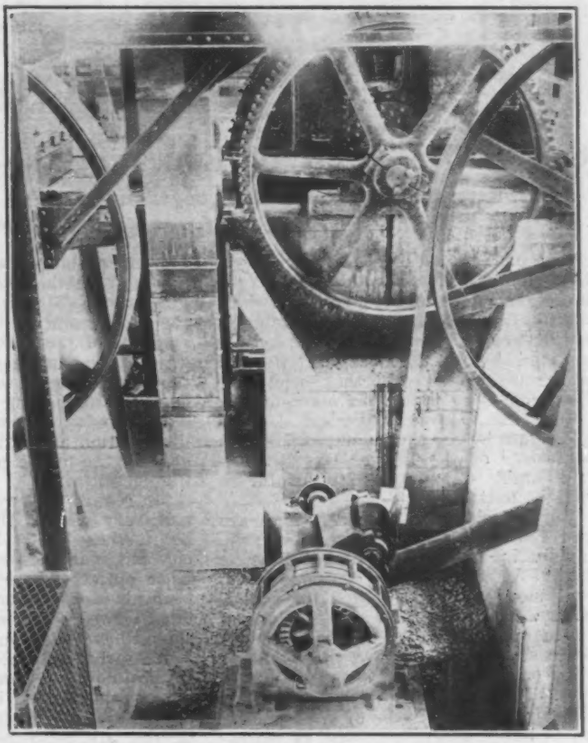
A switchboard similar to the one shown above, controls the electrical equipment installed in the plant of the Pacific Portland Cement Company. Temperature coils on each generator installed are connected with indicators on the switchboard.

Special care was given in planning the motors in this plant to see that they were suited as exactly as possible to the contemplated drive. In all drives where the starting conditions were heavy, wound rotor motors were specified having magnetic contactors in the primary circuit, which contactors are electrically interlocked with drum controllers that are to be installed in the slip ring circuit. This will prevent the starting of any of these motors unless the drum controller is in the neutral position.

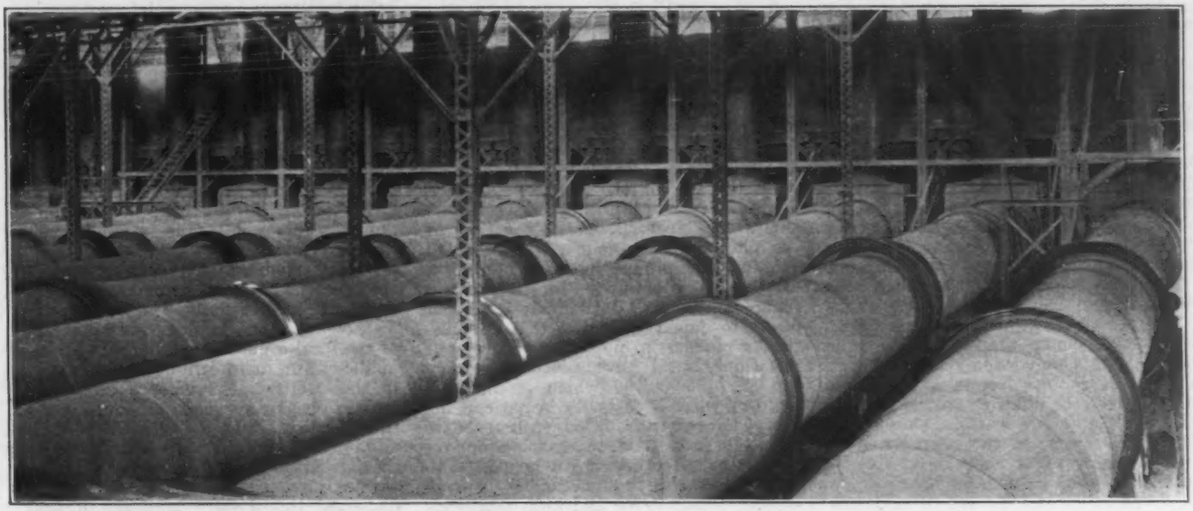
Special attention has also been given to trains of conveyors where these trains carry product direct one from the other. In such trains of conveyors magnetic contactors are installed and control wiring so arranged that the receiving conveyors must always be started first before it is possible to start the delivery conveyors. In a similar manner, the interlock is so arranged that if the receiving conveyor accidentally shuts down it will also trip the delivery conveyor.

A further point which received special consideration in this plant is a study of labor saving control so that it will require a minimum number of men to start and properly operate the various motor drives. In a number of cases this has resulted in the decision to install automatic enclosed starting compensators with iron clad safety push button control so that the operator can start these motors safely and accurately from a distant point. In all such cases where these automatic compensators have been installed, the personal safety features have been carefully guarded by properly housing the motor and its drive and by installing externally operated safety disconnecting switches near the motors so that when any work is necessary a local controllable cutout switch is available.

A most interesting feature of this development is a five and a half mile cable and bucket type of tram which is used for transporting materials from the quarry to the plant. In connection with the drive of this tram, it developed that approximately 15 hp. would drive it under normal operating conditions but that in the early morning hours after very cold nights it might require approximately 50 hp. to get it started. To meet this problem and to insure the necessary high power factor during normal operating conditions it is planned to install two speed variable speed wound rotor motors having a maximum capacity of 50 hp. at 1,200 r.p.m. and approximately 20 hp. at 600 r.p.m.



Electric drive is used extensively throughout the modern cement mill. The installation pictured is typical of those now in use in the cement mills of the Pacific Coast territory.



The Pacific Portland Cement Company manufactures cement in addition to gypsum plaster. The kiln room pictured is representative of equipment installed in modern cement mills in the West in which electricity plays an important part.

JOBBER, DEALER AND SALES AGENT

Cooperative Effort in Educating the Community

A Summary of the Duties of a Cooperative League as Outlined by K. A. McIntyre of the Society for Electrical Development

The part played by the local cooperative campaign or development league in solving some of the problems which are confronting the electrical industry at the present time has been concisely outlined by K. A. McIntyre, western field representative for the Society for Electrical Development, in a recent talk before the Denver Electrical League and again before the commercial representatives of the Denver Gas & Electric Light Company. Mr. McIntyre said in part:

"In the electrical industry there are two types of organization. Everyone is familiar with the National Electric Light Association and its operation, continuously working along lines leading toward the solution of technical and commercial problems connected with the central station end of the industry. The contractors, jobbers and manufacturers have their organizations. Then there is the second type of organization which has a different method of operation and different objects and that is the Cooperative Development Organization. We have the two forms of that organization, the one operating on a national scale, known as the Society for Electrical Development, and the second form of that same type of organization, the local development league.

"The object of that type of organization is to develop and promote the industry as a whole and then by participating in that and taking advantage of that work we will get our share of the increased development resulting from that work. Naturally, the support for this broad development program comes from the entire industry and not any one group and the work that is done by this type of organization is done for the whole industry, and so we have the different types of organizations working on the problems, the main point of which I have illustrated here, i.e., that our electrical achievements are far short of our pertinent possibilities, and I have a few statistics here which will readily prove this to you.

"In residence lighting a survey of 1,500 homes shows that the lighting in the average home is only 40 per cent of what it should be on a minimum basis for good lighting. This is in connected load or watts. There are about 26 per cent of the lamps shaded, only 13 per cent of them properly so. Here we have a splendid opportunity for more business but back of that lies something more important and that is the service idea. As an industry we are not rendering the public very good service when we permit this condition to obtain in the home. The matter of good vision is very necessary to comfort in life and the conservation of the eyesight of the young and old depends a great deal on the kind of lighting in the home. Today we do not live as did our ancestors, going to bed shortly after dark. Today is the day of artificial illumination and it behooves us to provide for the public good illumination for the conservation of vision.

"In regard to convenience outlets and necessary wiring, there were found to be in these 1,500 homes, not in one city but many cities, only two convenience outlets where there should have been nine outlets for the average home, twenty-two per cent of what there should have been on a minimum basis. It is hard to rate necessary wiring, but we do know it is anywhere from 15 to 50 per cent of what it should be and not on an electric home standard. Many of you are concerned with the direct sale of labor saving appliances in the home. The great development of these devices has come within the last ten years but the development of wiring in the home to serve those devices has not kept pace at all with the development in the appliances themselves, so we have this condition tying in inseparably with our work in trying to sell complete electric service. If we have incomplete or inadequate wiring to serve what we sell there will not be maximum results from its use. Also, ofttimes we will find it difficult or impossible to complete a sale because it will require considerable additional wiring at a great expense, whereas with that home properly wired in the first place it would be far easier to sell the device and greater satisfaction would result from the use of the service.

"In industrial lighting the estimate shows that from 25 to 40 per cent of the plants of the country are lighted only on a minimum basis. There is a wonderful opportunity for improving that condition. It is difficult to find a figure to quickly visualize the possibilities for industrial power and water applications, but I have selected this figure of $185,000,000 which is an estimate of what it costs the American industry in a year from loss in line shafting. There is a very tempting opportunity there for digging a hole in that $185,000,000 by the increased use of smaller group drive and individual motor drive.

"Then there is the appliance field. There are, I believe, 9,000,000 automobiles and only 2,000,000 electric washers. That is quite a contrast when you compare the price of automobiles with the price of washers. It just comes back to the point and supports my statement that electrically we are far short of even our electrical possibilities and I would like to make clear this thought,—that in the development of the electrical industry we are contenting ourselves with the contemplation of the wonderful growth we have attained in the short 40 or so years of our existence, while as a matter of fact most of that development has been due to invention, discoveries and new improvements rather than to concerted effort on our part. We are going to have that same sort of growth in the future. We have nothing to do with it, really, and what we are concerned with is this fact,—that we are far short of our possibilities and we want to increase our standing from where we are to what we ought to be, in other words, increase the normal rate of development.

"The principal reason for this condition is that the public does not know. You are up against that every day. The electrical contractor and wiring man in trying to sell more wiring is up against the proposition that the public does not know and it makes it difficult for him to sell the proper wiring job. In practically every sale that you make you meet this same thought. You first have to inform and then convince your prospect of a lot of ordinary, every-day electrical things with which they ought to be familiar. You have to dispel that before you can break down the normal sales resistance and complete your sale.

"The responsibility for correcting this condition rests on the electrical industry and those who engage in this cooperative development work, recognizing the responsibility it carries, are being considered as a part of our service as an industry to the public, supplying them with correct information, all of this designed to bring about the condition of an intelligent, well informed public. The best means is publicity in its many forms, and publicity may mean anything from newspaper items to an electrical home or other demonstrations or educational exhibits. There are many methods that can be put over by means of the local organization and all of these methods aim at informing the public as to the comfort, convenience and economy of electric service, and at the same time endeavoring to create in their minds the desire to avail themselves of this electric service. In doing this job we have great odds against us and to illustrate this I have used the figures 328 to 1. There are 115,000,000 people in the United States and Canada and only approximately 350,000 in the elec-

trical industry, so we will have to work together if we are going to do this. In that connection there are only a few of the 350,000 who are on the job. Many men and women in the electrical industry regard their jobs only as a meal ticket. They do not get the idea that they are a part of a wonderful, growing, essential industry, nor do they stop to realize that their whole opportunity for personal advancement depends largely upon the growth of electrical industry, that it is a part of their job to bring about this condition, and to help build the foundation."

Mock Trial Reveals Advantages of Electric Washer

That indirect advertising is an effective method of arousing in the mind of the public a maximum amount of interest regarding electric household appliances has been proven by the Western Electric Company and the S & H Electric Service Company in Los Angeles. The means employed are so simple as to be applicable in any community where a contractor-dealer, jobber or manufacturer desires to sell both the electrical idea and his own products.

No..... Dept. .....

In the

HIGH COURT

of the

Degree Staff of the Pythian Sisters

In and for the District of Belvedere

Notice and Order

THE PEOPLE OF THE DEGREE STAFF OF THE PYTHIAN SISTERS OF BELVEDERE

vs.

R. E. HELLEMS,

Defendant.

Official looking summons employed to arouse public interest in the trial.

In the case in question a prominent citizen of Belvedere, Calif., was haled into court for the high crime of failing to provide his wife with the means for properly doing the family washing. The mock trial was held before Degree Staff of the Pythian Sisters and so great was the interest aroused that the hall where the trial was held was crowded to capacity on the night of the trial. Approximately 1,500 men and women attended. Requests have been received from other fraternal orders in the district to stage similar affairs, and two trials have been held subsequently.

Local interest was secured because all of the participants in the trial were local people. The attorneys for the prosecution and defendants were bona fide lawyers and both entered into the spirit of the occasion to such a degree that even the spectators were convinced that the trial was real.

Each member of the Pythian order was notified of the trial by an official-looking summons, a reproduction of which is shown. The text of the summons follows:

IN THE HIGH COURT OF THE DEGREE STAFF OF THE PYTHIAN SISTERS IN AND FOR THE DISTRICT OF BELVEDERE.

The People of the Degree Staff of the Pythian Sisters of Belvedere.

vs. NOTICE AND ORDER.

R. E. Hellems,

Defendant.

TO THE PEOPLE OF BELVEDERE, GREETING:

You and each of you are hereby commanded to be and appear at the trial of the defendant, R. E. Hellems, who has been duly charged with a grave crime, to-wit: the failure to provide his wife with the proper equipment for doing the family washing.

You are hereby ordered to come prepared to give whatever testimony possible touching the general habits, character and responsibility of this defendant to the end that justice may be meted out, and that the danger which now threatens the homes of all the women of our beautiful community of Belvedere may be averted.

The trial will be held at the Court Rooms at the corner of First and Rowan Streets, Friday, November 10th, at 8 o'clock, P.M.

Attorney for the people, D. W. Garwood, will do his best to protect the community; Charles E. R. Fulcher, will fight equally hard to keep his client from the grave penalty of having to spend some of his money to make the housework easier.

GUY F. BUSH,
Judge of the Court.

Prominently displayed on the stand on the night of the trial was a modern electric washer while beside it was a tub, washboard and boiler. Before the case was finished all of the many advantages of the electric way of washing as compared to the old-fashioned way were brought out and in the end the jury found the defendant guilty of gross cruelty.

So simple is this method of indirectly bringing to the attention of the men and women of the community the advantages of the electric washing machine that it can be applied in any community where an enterprising contractor-dealer will secure the cooperation of the members of a fraternal order or women's club.

YANKING HOME THE YEN

By JOE OSIER

"Just scales and full measure injure no man," remarked Too Fat, the Exalted Ruler of the now celebrated High Hip Tong—

As he flicked a fleck of fuzz from his embroidered silk kimono, took an extra sip of Chinese gin and went on with his address entitled:

"Yanking Home the Yen."

"You are aware, brother tongmen," he asserted, "that we are in business for some other purpose than—

"Wearing out our old clothes.

"We have sampans to keep afloat and seaworthy; we have children whose little stomachs cry for chop suey; we have wives who daily chide us because we are not as affluent as—

"Louie Lung and thus and so—

"Therefore, my friends, it is up to us to collect the yen and the sen which we have earned.

"Know ye, that it is better to take eight hundred cash than give credit for a thousand and—

"If you pelt dogs with meat dumplings you will lose all and get nothing!"

After hurling the above to posterity, Too Fat walked from the stage amid a tumult of hand spatting and retired to his counting house where he said—

"No can do" to fifty borrowers during the remainder of his shift.

Now, if Chinese business men deem it imperative to make collections, why should not those engaged in the electrical industry, do likewise?

They, too, have installments to pay, homes to maintain, kiddies to feed and wives to bedeck and—

If they do this and keep out of court, they must—

Collect the collateral before the debt is outlawed or—

Their debtors have died.

I have been informed that many firms go down the—

Long, wrong trail—

Because they were lax in making collections; because they feared to offend by making demands for money; because they would rather—

Die than dun.

This attitude, I swear by the beaver of a bard, is preposterous—for—

Any business man, worthy of credit, will agree that a demand for money, honestly earned,—

Is the proper checker—and—

That the boys who do not call for their clams should be measured for—

Wings and harps and wafted on their way.

I fully realize that busines is a matter of credit, more or less—still—

I feel prompted to state that if there was more cash and less credit in business—

There would be more business men smoking cigars—

Made of tobacco and—

More industries assuring suitable return on the "bees and honey" invested.

I may be wrong but—for the sake of this column, I will not admit it and—

Seeing that I cannot argue further, owing to lack of space, I shall call it a day and—

Turn over the floor to the opposition.

To't, brothers.

Because a large percentage of the people of El Paso, Tex., are of Spanish descent, the El Paso Electric Cooperative Association decided to have the Electrical Home, that it displayed, built on the Spanish type of architecture. The home pictured above was visited by nearly 11,000 people.

The New Spanish Type Electrical Home in El Paso

Largest Appliance Sales Ever Recorded in City Resulted From Publicity Gained in Displaying Modern Home

The home electric exhibition which was held recently in El Paso, Tex., resulted in the largest merchandise and appliance sales ever recorded in the history of the electrical industry in that city, according to the report of the El Paso Electric Cooperative Association, under whose auspices the showing was held. These sales included some of the larger appliances, such as refrigerators and electric ranges. In addition, the contractors of the city have felt an increase in business, one firm having received a contract to wire four houses in the same manner as the one shown. The non-electrical organizations which cooperated in the exhibition, such as furniture dealers, also report sales traceable directly to the home.

A total of 10,982 people visited the house, which is a good percentage of El Paso's population of 80,000, 60 per cent of whom are Mexicans. Based on the attendance and total cost of advertising, the home was displayed at a cost to the association of approximately 2¼ cents per visitor.

In arranging for the display of the home, an organization known as the El Paso Electric Cooperative Association was formed by the electrical manufacturers, dealers, contractors, jobbers and central station of the city. This association was to foster the cost of the electrical home and was to contribute to the cost of advertising and exhibiting the home. The house was financed by C. A. Winder, the El Paso manager of the Southwest General Electric Company. Subscriptions were taken from all of the members of the association and funds secured in this way were used in displaying the home to the people of El Paso.

Arrangements were made with the various furniture dealers to furnish all of the furniture, electric piano, electric phonograph, etc., for display purposes. These firms received their compensation from the advertising that their products received while being viewed in the home.

Wiring materials and electrical equipment for permanent use in the home, such as range, water heater, refrigerator, etc., were furnished by the manufacturers at actual factory cost plus transportation charges. Electrical appliances for display purposes were furnished by the various electrical dealers, at no cost to the association. Electrical contractors who wired the house did so at their own cost for labor, and the general contractors built the house at actual cost to them.

In this way the cost of erecting the house and of supplying it with equipment for display purposes was held down to a minimum, thus giving the association the opportunity to keep the cost per visitor at a remarkably low figure. The final figures prepared by the executive committee showed that the association spent a total of $2,500 for advertising, publicity and exhibiting the home to the 10,982 visitors.

The members of the association realized that the body was too large to work as a unit in directing the policies of the home and decided to have committees named to direct the several branches of the work. An executive committee with powers for general supervision of the financing and constructing of the home, was appointed. This committee was aided by an advertising and publicity committee, a house committee, a decorating committee, a wiring and inspection committee, an appliance committee and an illuminating committee. These sub-committees supervised the details of erecting and exhibiting the home. All of the factors represented in the association were represented on each committee in proportion to their qualifications for giving advice on the particular task assigned to the committee members.

Appliances to be displayed in the home were selected by the appliance committee from the stocks of the electrical dealers and jobbers in the city, a few appliances being taken from each establishment. In the case of equipment such as range, clothes washer, dish washer, etc., the various firms handling these appliances were allowed to have their appliance on display at given periods. All cost of hauling to and from the home and costs of any damage done to equipment was stood by the firm owning it.

The house committee had full charge of the displaying of the home. Matting and iron posts with suitably painted chains were placed throughout the house so that visitors would not be walking all over the rugs or picking up appliances and the like, or marring the appliances, furniture or fixtures. This facilitated the handling of the crowds.

At the main entrance, which was a door leading into the living room, through which all people entered the house, a negro porter in full dress uniform received the visitors. He was also furnished with a small counter and kept track of the number of visitors. It was found necessary to permit people in no larger crowds than ten or twelve. On days when the crowds were large there was a man stationed in each room, describing in detail the advantages of the use and convenience of electricity, and other matters of interest in that particular room. However, on days when the crowds were light and the people

came in small groups, one man would take a group entirely through the house. After the people were taken entirely through the home they left by way of the garage, where a young lady was stationed who registered the names and addresses of all visitors, at the same time giving them a pamphlet describing the home in detail. This plan of having the people register and giving out pamphlets at the end of the journey proved a great deal more satisfactory than if the registering were done as they entered the home.

The home was extensively advertised in the newspapers, on billboards, street cars, show windows and by pamphlets, and publicity in various other forms. The planning of all advertising and publicity was done by the advertising committee and then approved by the chairman of the executive committee.

Newspaper advertising was divided into two classes, namely, direct display advertising and tie-in advertising. The first consisted of large display advertisements outlining what the home meant to the community in the way of better and more convenient homes and the distinctive electrical features which this home afforded. The tie-in advertising in newspapers was done by the electrical contractors, dealers, power company and other electrical interests, in which either the whole or a part of the space was devoted to advertising the electrical home, and inviting the public to visit it. This form of advertising was also carried on by the furniture firms, music houses, plumbers, general contractors and others concerned in the home.

The association secured billboard advertising opposite the Hotel Del Norte, which is the principal hotel in the city, and one at Five Points, an important gateway to the various residential districts. Boards were finished in many colors and were very attractive. These boards showed Aladdin as the magic servant and first called the reader's attention to the fact that there was an electric home under construction. Later they were changed to read "Home now open."

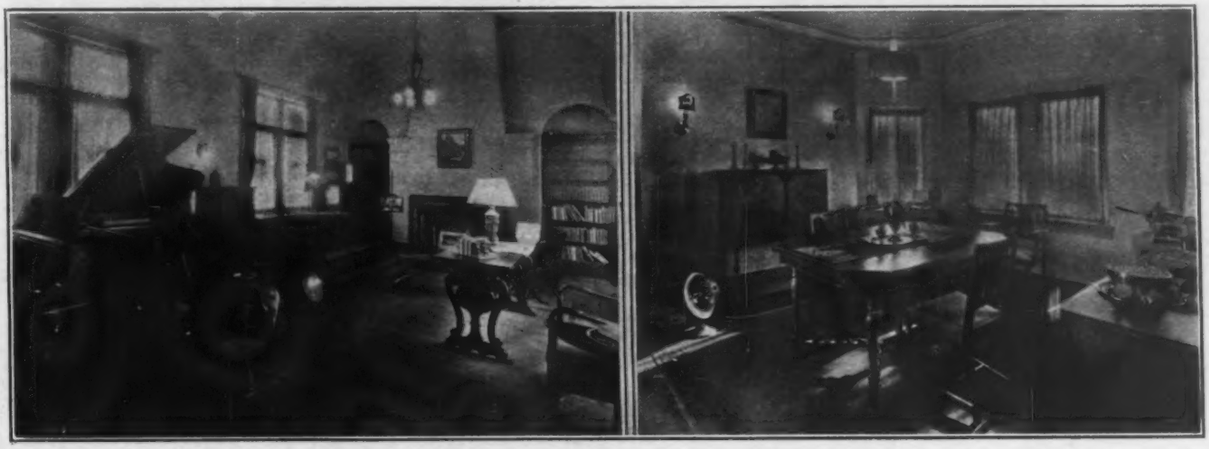
Street car advertising consisted of advertisements carried on the dashboards of all street cars for at least two weeks before the home opened and for the entire time that the home was being demonstrated. On the principal thoroughfare leading from town to the electrical home, board advertisements were placed on the lighting poles which read, "Follow the Arrow to the Electric Home." Moving picture slides were used during the first ten days that the home was exhibited. Stickers were placed on the bills sent out by the central station, various manufacturers and contractors.

The kitchen of the El Paso home was modern in every detail. Sufficient appliances to make it completely electrical were installed and care taken to have ample convenience outlets for the devices.

The most important publicity for the home was in the form of news stories in the daily papers. The various members of committees prepared at various times before the home was opened and while it was being exhibited, news items regarding the home. The articles called attention to the lighting, furnishing and various items of interest. Before and during the time the house was being exhibited talks were made by members of the association before the various luncheon clubs, civic clubs and by radio.

While the home was being exhibited, an illustrated booklet entitled "My Own Electric Home in El Paso" was distributed to the guests. This booklet carried a number which corresponded to the number on the guest register that each visitor signed. Each day that the home was on display a drawing was held and the person holding the winning number was presented with an electrical appliance donated by the members of the association. The booklet contained floor plans of the home and the type-matter described the way a modern woman would have her home equipped.

The home was opened to the public for inspection Dec. 10 and remained open throughout the rest of the month. On the first day, which was a Sunday, the home was opened at 2 p.m. and closed at 10 p.m. The remainder of the time it was open for inspection from 10 a.m. to 10 p.m. except on Christmas Day, when it was closed all day.



The living room and dining room of the home received careful attention from the electrical men that these rooms might be illuminated correctly and sufficiently. Ceiling fixtures supplied the general illumination and were supplemented by wall brackets and artistic table and floor lamps.

An Electrical Jobber's Direct-by-Mail Advertising

Separate Lists for Each Class of Dealers Permits Advertiser to Send Specialized Literature to Customers

By JOHN T. BARTLETT

The problem of selecting a group of names to be used for mailing lists has always been one of the stumbling-blocks met by the electrical jobber or dealer who is starting a campaign of sales letters or advertising circulars. Many times the advertiser has had a list compiled which includes the names of all prospects and has mailed letters to these persons to find that a large percentage has brought no results.

The electrical jobber or dealer has a large number of products to sell and naturally all of his prospects will not be interested in the same devices. Because of this condition the advertiser must send a different type of advertising matter to each class of prospective customers, if he wishes to obtain the best results from his appropriation.

In embarking upon a mail advertising campaign, the person in charge should first select the list to which the letters are to be sent and then should decide on some definite schedule to be followed in the campaign. A third consideration in planning for sales-letter distribution is that the letter should carry the individuality of the firm to the prospect, as the letter is the representative of the firm.

John J. Cooper, of the Mountain Electric Company of Denver, Colo., has worked out a system for circularizing his dealer customers which has proved exceedingly successful. The electrical dealers that purchase from this jobbing firm are of many classes and serve a wide variety of customers. It is therefore necessary that some definite grouping of names be made for the advertising lists that are sent out monthly.

Mr. Cooper, therefore, draws up for himself at the beginning of each year a mail advertising schedule. It is in score card form, with different departments of the business down the left side, and months of the year above the longitudinal divisions. Month to month, Mr. Cooper checks on this, his "performance."

The schedule is not always absolutely followed. Last year, in the rush of things, for example, Mr. Cooper slipped up on lamps. Other lines received proper attention, however. For the past two or three years, this Denver jobber has followed a simple, yet comprehensive, system of direct mail advertising. He has obtained results from it and made satisfactory accomplishment in directions he started.

On the score-card arrangement alluded to, there appear down the left side, in order, Hotpoint, Fans, Motors, Meters, Lamps, General-Breezelet. These are the classifications Mr. Cooper has separated his business into for mail advertising. All but one he plans to advertise throughout the year. The one is Fans. Fans are advertised monthly up to July 15. Motors are advertised monthly, with a large mailing card. General-Breezelet, has reference to a large list to which letters advertising various articles are sent, along with the Mountain Breezelet, quoting prices and discounts on many lines. On Hotpoint, which heads the list, letters are sent monthly throughout the year.

For each of these various classifications, an individual list is used. This means that advertising on a certain line is sent only to possible buyers of that line; waste is kept down, advertising effectiveness increased.

Ask a group of representative Colorado electrical dealers about interesting sales-letters they get, and it is a ten to one shot that the majority will mention "letters from Cooper." Talking about his advertising experience, Mr. Cooper explained that he started using letters regularly with several objects in view. One was to bridge, in a way, the gaps between visits of his salesmen to dealers, as there are often quite long intervals between these visits. Another purpose was to hammer away at certain things of fundamental importance in good retailing—turnover, particularly. Another, one might describe as "dealer fight"—an aggressive attitude toward business. On top of these things, of course, were selling arguments in behalf of different lines of merchandise.

Nobody questions that Mr. Cooper's letters do help to bridge gaps. Mr. Cooper wrote these letters, in the first instance, himself—"just as he talked." When other duties pressed too hard, he located a letter expert who could talk with him for a short time, discuss an idea, and then put Mr. Cooper's personality on paper, writing a letter which not only sounded like Mr. Cooper, but was Mr. Cooper.

The following might be described as of the energizing type. The postscript begins an annual task Mr. Cooper puts on letters—stimulating end-of-the-year orders. This letter, like other letters, went under 2-cent postage. It was multigraphed, with the name and address filled in.

"Dear Mr. Brown:

"I 'knocked off' last Saturday and went to a football game. Had a whale of a time, lost my voice from yelling like a Comanchee and otherwise acted like a school boy. But I got a big merchandising idea and I decided that the first order of business this week would be to put it to work—and pass it on to you fellows for what it's worth.

"As I sat there watching those young 'wild' men tearing into each other I asked myself how many games a group of business men would win if they played football as they 'play' business. And I decided that compared to those huskies on the field, we business men were an awful bunch of pikers and that OUR methods wouldn't win a football game in a million years.

"Talk about 'hard times' and 'resistance,' I'll tell the world that the opposing line in a football scramble is the REAL thing. But what do the boys with the ball do? Wait until 'times get better,' until there's less 'sales resistance' to overcome, before they 'play the game'? Not on your tintype! They HIT the line, not once but time after time with every ounce they've got, and if they can't get through at one place they try another! If straight driving energy won't do they try every trick the coach knows! They KEEP on trying, every bloomin' second!

"What a lesson for merchandisers! Wouldn't the old cash register sing a long sweet song if we business men had a tenth part of the aggressiveness of the football squad? Come on, let's buck the line!

"There isn't any REAL resistance in a country that has hundreds of millions of dollars to loan Uncle Sam at 4½ per cent. Great ham and eggs, the money is there! What in Sam Hill ails us fellows who have electrical merchandise to sell? Can't we show the dear public that modern electrical stuff will pay several times 4½ per cent in comfort, convenience, pleasure, etc.? Sure we can! We've got the punch! But for the love of Andy Gump let's PROVE to somebody that we DO have it.

"Cordially,

"JOHN J. COOPER."

"P. S.—Between Dec. 10 and 20 each year we get telegrams and long distance pleas for 'hurry up' shipments until 1623 Glenarm is a regular madhouse. However, we've most always come through 100 per cent, but if you'll order your Holiday Goods NOW, there'll be no chance for disappointment, and we'll both be mighty happy Christmas morning."

A great many of the letters the Mountain Electric Company sends out begin with some human interest incident. One letter early last fall began by telling of a sales letter just used by a Denver firm which had contained a check for 3 cents, for the purpose, as the letter said, "of paying for the few minutes time it takes to read this letter."

"Just compare that 3 CENTS," remarked Mr. Cooper in his letter, "with the DOLLARS (and a lot of 'em, too) that came to YOU through the mail about two weeks ago in the form of the new Hotpoint price list. It carried 37 prices in red ink, meaning REDUCED PRICES in the majority of cases, the balance being NEW, easy selling appliances."

"Why, gosh darn it, there's no comparison between the pennies those guys got and the dollars you got on these reductions."

An everyday little incident, full of color and applicability, caught for a sales letter, "put it over." There is a lesson here for the dealer getting up sales letters for consumers—a human little incident is big with value anywhere. The incident in the following case helped to hammer home the turnover principle.

"Somebody said to me the other day: 'I don't see how in the world the Scholtz-Mutual Drug Stores can buy the great wads of advertising space they do, sell on a small margin and still keep in business.'

"Well, I wasn't any too sure myself and rather than hazard a lot of wild guesses, I decided to keep still, do a lot of thinking, and see if I could dig up the formula.

"I didn't have such a job at that. My Sunday paper contained a full page Scholtz-Mutual ad and at the top in big headlines was something like this:

'Eighty-nine per cent of our merchandise is fresh every nine days!'

"Holy Mackerel! What a university course that is on the big subject of 'turnover.' Three hundred and sixty-five days divided by nine gives FORTY turnovers a year that they can get on 89 per cent of the stuff they sell. No wonder they can make money. Why, even 4 per cent net per turnover would give them 160 per cent profit per year on their investment.

"How do they get that volume of business, eh? Please notice the next Scholtz-Mutual ad, and you'll see that they spend lots of their own money pushing goods that are widely advertised by the MANUFACTURERS.

"They 'tie into' the nationally created demand with **their own** sales effort. They don't seem to worry about the big question of 'long margins vs. small margins' at all. All Scholtz-Mutual asks is that the article be in DEMAND—to hang with margins if there is DEMAND for the article. Why, they even go and CUT the heart out of the margins that the manufacturers thought they ought to have.

"Now, do you see what I've been driving at when I've been dinging away at you to forget long margins on UNKNOWN lines of electrical appliances and PUSH a good KNOWN line like BLANK SERVANTS that carries a good honest margin of profit?

"Three Blank sales per week at 30 per cent per sale, leaves you a lot better off than one sale on the unknown, even if the unknown carries 45 per cent. What say? Sure! But how are you fixed on stuff you'll need for Xmas trade?

"Are you going to order it NOW and have it when the sale comes in, or are you going to hope that WE have more faith in YOUR customers than you have and that WE'LL order it and keep it in stock until you NEED it? We'll go as far as our capital will permit, but we don't have the capital to stock all the appliances that will be bought this Xmas in the Rocky Mountain States.

"Cordially,

"JOHN J. COOPER."

Mr. Cooper on one occasion sent out a two-page letter, but he did not try the experiment again, deciding that a single page was all that he could expect most dealers to read.

From the two letters quoted, the reader will be able to understand that Mountain Electric Company letters get read. One fact ought to be emphasized again, and that is that these vigorous, outspoken letters reflect accurately the personality of the man who signs them—Mr. Cooper. They "fit" him. Sent out in the name of a different jobber, they would assume a quite different aspect.

This direct advertising plan of the Mountain Electric Company has been successful. In particular, the "plan" feature should be heeded—the drafting of a year's effort in advance.

The Square D Company, Detroit, Mich., has recently placed on the market a new convenience outlet, which in addition to presenting a pleasing appearance embodies several unique features. In the outlet the terminal and four jaws are made of one piece of metal thus eliminating connecting screws and poor contacts. No sealing wax is needed in the outlet as all current carrying parts are enclosed by the two pieces of porcelain.

One-act Play Gives Advice to Electrical Salesmen

As a hint to electrical salesmen who are anxious to give their customers better service, the National X-Ray Reflector Company has recently printed a farcical "tradgedy" entitled "And So the Day Is Ruined." The purpose of the one-act play is to encourage salesmen to make their orders out in a better manner that needless delays may be averted.

The lines of the play are as follows:

Scene I.

Any salesman's office.

(Bill, tearing open telegram about delivery of the big 'Whoosis' order):

? !!!! ?* ..D..$? ,rr% ! ! ! I can' see why'n' x? ! subtn * _!?%, might as well quit tak'n orders. D.... (?). 'n here I got this whopper for Whata MacCallem's,....gotta have service that's all!

(Grabs paper and scribbles what ought to be done with service department. Hurries out—mails letter with this new order Special Delivery.)

Scene II

Main Office. Everyone full of pep and at their desks before 8:15 a.m.

(Sales manager looking over mail. Usual Morning smile. Watch it dwindle when he reads Bill's letter.)

"Oh, Les'. What's the reason you can't ship this Whoosis order?"

Les': "Why, the order came in without any information at all and we had to wait three weeks before we got enough details to even write it up."

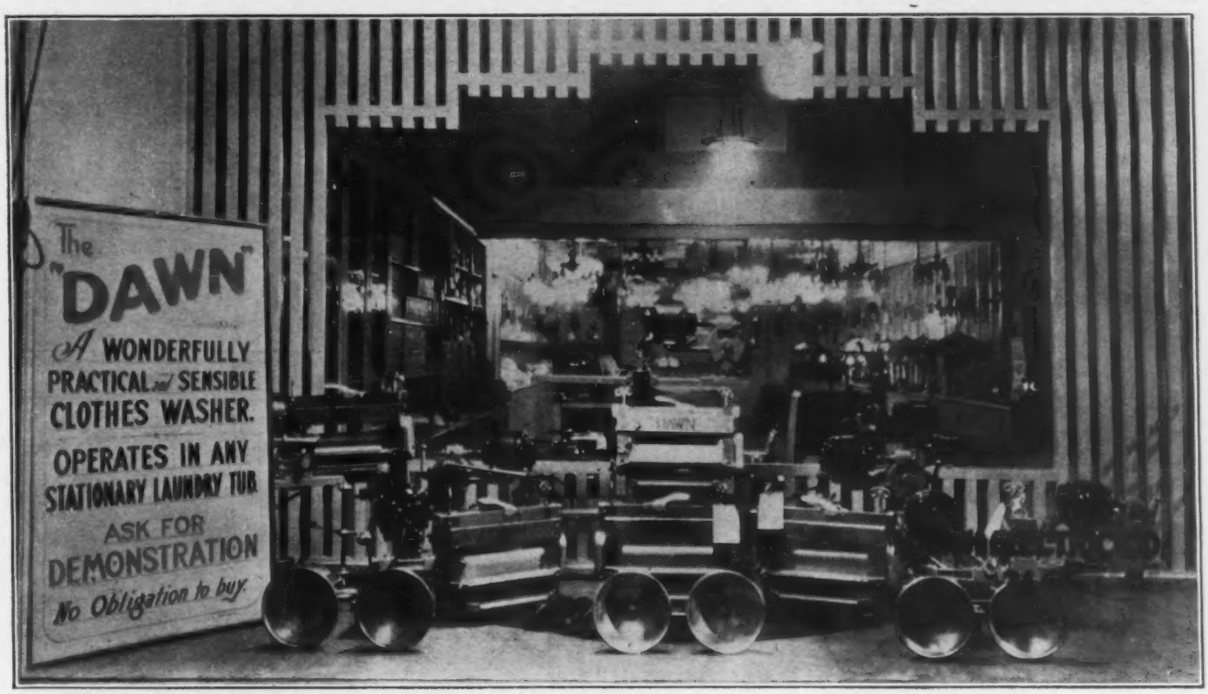
S. M.: "See if you can't crowd things to give Bill a better promise."

(Resumes looking over mail. Smile returns when he sees raft of orders.)

Bill's order is on top. It's incomplete like others. . . . What 'n—look at the IMP "Finish to follow" jump out from this order. IMP from second order with "No dimensions" joins him while third and fourth IMPS "No suspension" and "Details to follow" with an army of other procrastinators jump out and, ——, ——.

And when YOU want YOUR order
**D Q—and you don't get it—
YOUR day will be Ruined unless—

Alright. That's fine. We'll all try to help!



Lack of window space has usually kept electrical merchants from displaying more than one or two electric washers at one time. Many times decorators have been anxious to place more than this number in the window, feeling that a greater number would attract more people, but the size of the washers has prevented this. The L. B. Marsh Electric Company of Long Beach, Calif., was recently able to present a unique display by using small washing machines in its window. Eight complete machines may be seen in the display which was presented by it.

INDUSTRIAL NEWS

P. G. & E. to Start Construction on Pit No. 3 in Thirty Days

The construction of Pit No. 3, the second of a chain of power houses which will ultimately develop over 600,000 hp. from the waters of the Pit River in northern California, will start within the next thirty days, according to an announcement made by John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company. The plant will have a capacity of three 27,000-kva. units and will be completed by the fall of 1925. The development will involve the expenditure of ap-approximately $17,000,000.

Pit No. 3 will be located about 16 miles below Pit No. 1 power house. Installation will involve the construction of a diversion dam 125 ft. high at a point 2½ miles below Peck's bridge on the highway between Burney and Bartle. From this point a tunnel, approximately 22,700 ft. in length, having a capacity of 3,000 cu. ft. per second, will carry the water to a point above the site of the power house. The plant will operate under a static head of 313 ft.

The initial step in the development will be the construction of an extension of the Pit River railroad. The line will branch at Cayton Valley and will follow the river in a southwesterly direction a distance of five miles to the damsite. The road will then extend five miles farther to the site of the power house. A gravity road will lower the material to the construction camp at the damsite.

Before work on the permanent dam is started a temporary diversion dam and tunnel will be constructed in order to facilitate construction work. The driving of the four-mile tunnel will start immediately. The installation will also require the construction of eight miles or more of double circuit, 220-kv. transmission line from power house No. 3 to the main transmission line.

In connection with the announcement relative to this latest step in hydroelectric development, Vice-President Britton stated:

"The company, in its electric service side, is growing at a rate of 20,000 to 25,000 kw. a year of 'peak.' Our engineers calculate that the demands for electric energy increase at the rate of 7½ per cent per annum, or an increase in kilowatt-hour requirements of 120,-000,000 kw-hr. a year. Now, it was a pleasure to record the opening of Pit No. 1 plant last fall, but this, despite the fact that it may be expected to contribute nearly one million kilowatt-hours per day to our electric distributing system, did little more than fill the gap between supply and demand that had been occasioned by a slackening in construction work during the period of financial depression preceding the war and, of course, during the war period itself. We expect to complete Pit No. 3 by the fall of 1925 by whiih time, according to our calculations, the demands upon us for electric energy will have increased between 350,000,000 and 400,-000,000 kw-hr."

Members of Engineering Council of Utah Elect Officers

At a meeting of the Engineering Council of Utah, held at Salt Lake City on March 3, the following officers were elected to serve for the ensuing year: president, Dr. Joseph F. Merrill, director, School of Mines and Engineering, University of Utah, and past chairman of the Utah Section, American Institute of Electrical Engineers; vice-president, W. E. Hare, architect, past chairman, Utah Section American Institute of Architects; and secretary-treasurer, Howard C. Means, state road engineer, and chairman Utah Section American Society of Civil Engineers.

The Engineering Council of Utah is an affiliation of all Utah engineering societies, and represents about fifteen hundred men of the engineering profession. This is the largest body of organized technically trained men in the state of Utah.

City of Seattle Will Build 100 Mile Transmission Line

Bids for the construction of 100 miles of 165,000-volt transmission line and telephone line from the Gorge Creek plant on the Skagit River development of the City of Seattle will be called for April 13, according to C. W. Uhden, chief engineer of the project. Specifications will be completed by March 30 and will be on file in the office of the chief engineer, 1400 Alaska Bldg., Seattle.

The line will bring power from the Gorge Creek plant, the first unit of Seattle's municipal development program on the Skagit River, to a substation outside the city. The plant, which will have an initial capacity of 34,500 kw., will be completed late in 1923 and it is planned to have the transmission line ready for operation at the same time.

The factory which the General Electric Company has erected at Oakland, California, was put in operation March 1, and is being used primarily for repair and service work and the assembly of switchboards. It is the intention later to undertake the manufacture of distribution transformers.

Underwriters Will Open Testing Laboratory in West

A Pacific Coast testing laboratory similar to those already established in New York and Chicago will be opened in San Francisco about April 1 by the Underwriters' Laboratories, Inc., according to an announcement made by A. R. Small, vice-president of the organization, at a meeting of San Francisco Electrical Development League on March 12, 1923.

Mr. Small's visit to the Pacific Coast, together with the announcement of the establishment of the Pacific Coast laboratory, marks the culmination of a wave of sentiment that had its inception previous to the World War. So important has the electrical industry become on the Pacific Coast that it was felt that western manufacturers who desired to have their products passed by the Underwriters' Laboratories should not be compelled to undergo the expense and time involved in sending specimens to Chicago.

The laboratory will be installed at 615 Commercial Street. It will contain the latest equipment for testing electrical devices, appliances and materials, and will be on a par with the New York establishment of the company. R. J. Larrabee, resident electrical engineer for the company, will be in charge of the staff of experts to be employed at the laboratory. Charles Lum will act as district agent for the organization with headquarters in San Francisco.

The Colorado Power Company, Denver, Colo., will provide electrical energy for driving the Moffat tunnel through six miles of granite underlying the Continental Divide in western Colorado, according to announcement just made in Denver. The Moffat Tunnel Commission, a state body, has just awarded the contract. The Colorado Power Company will extend a line 30 miles to the portal of the tunnel. The expense of the line will be borne by the state, it is understood. It is estimated that the tunnel proper, which will be preceded by a pioneer, or working tunnel, will require three years of labor before it pierces the range, through which coast-to-coast trains will be routed.

The United States Reclamation Service is offering for sale to the highest bidder two canals located in the Klamath Reclamation District in northern California and southern Oregon, near Klamath Falls, Ore. The canals are known as the Ankeny and Keno Canals, and bids will be received on April 25. Full details concerning the sale appear in the "Searchlight Section" of this issue.

Work on Moccasin Creek Plant Progressing Rapidly

Construction work is progressing rapidly at the site of the Moccasin Creek power house on the Hetch Hetchy and city officials of San Francisco now estimate that the plant will be in operation before the middle of 1924. On March 2, 1923, approximately 1,680 ft. of the 5,000-ft. tunnel from the forebay reservoir to the top of the penstocks had been driven while more than 16 miles of the 18.3-mile tunnel from Intake to Priest had been completed. This tunnel will be completed in four months. Excavation for the four penstock lines is completed, excavation for the power house is under way and the contracts for the structural steel and both electrical and hydraulic equipment have been let. All power equipment is to be delivered before Aug. 31, 1923.

The power house structure as now being built will be 225 x 70 ft. in plan with provision for the addition of 75 ft. in length to accommodate additional units to be installed later. Four generating units are going in under the present contract. These will include four 20,000-kva., 257 r.p.m., 3-phase, 11,000-volt generators driven by double overhung impulse wheels rated at 25,000 hp. and operating under effective heads of 1,250 ft.

Where the penstocks enter the power house structure the flow will be controlled by eight 36-in. gate valves operated by hydraulic power. The power house equipment includes an overhead crane with a span of 50 ft. and a capacity of 135 tons.

The distance from the Moccasin Creek power house to San Francisco is 135 miles and survey crews are now in the field making final location for the double-circuit steel tower line which will be completed and ready for service before the power house is finished.

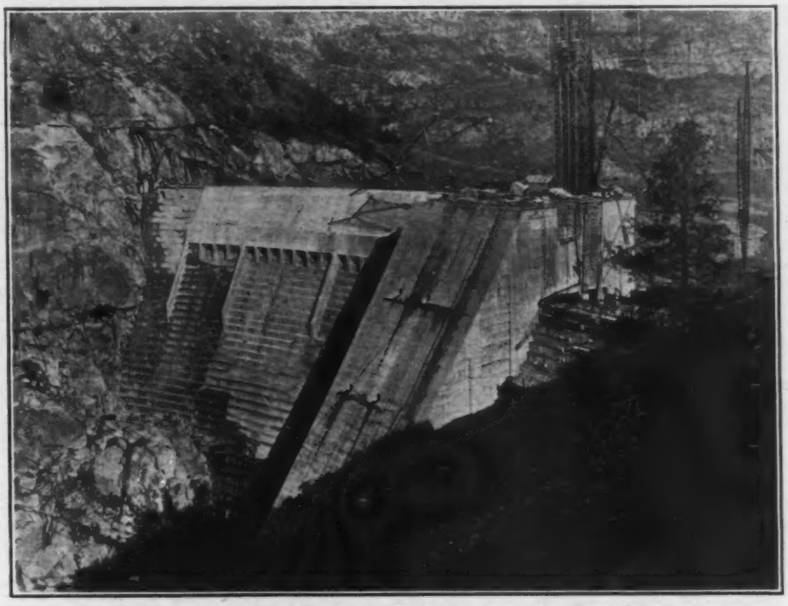
For the mountain and valley section of the transmission line a total of 525 miles of steel core aluminum cable has been ordered. This will have a cross-section of 389,000 circ. mils, the equivalent of 250,000 copper circ. mils. For the San Francisco Bay division of the transmission line order has been placed for 177 miles of hemp core copper conductor with an area of 345,000 circ. mils.

Transformers and switching equipment at the new power house will be of the outdoor type. Thirteen 6,667-kw. single-phase transformers will take the current at 11,000 volts, delta connected, and deliver it at 115.000 or 154,000 volts star connected. Both oil and air break switches will be provided, designed to operate 154,000 volts, which will be the tension for which insulators and other transmission equipment will be provided.

The Hetch Hetchy dam on the Tuolumne River is practically complete. The dam rises 226.5 ft. above the stream bed with the base of its foundations 118 ft. below. Ultimate plans call for the addition of 85.5 ft. to the dam.

The Reed power bill, now before the Washington Legislature, and which gives cities authority to sell surplus power outside their limits, has been passed by the House, and has been passed by the public utilities committee of the Senate, and returned with three amendments, as follows: that cities be given authority to sell surplus power, under jurisdiction of the Department of Public Works; that cities pay an annual license fee equal to 5 per cent of the yearly gross receipts from the sale of such power; that one-half of the revenue so obtained go to counties where plants and transmission lines are found; and that the measure be submitted to the people in 1924.

Work on construction of the proposed Kettle Falls plant of the Washington Water Power Company of Spokane, Wash., will be started as soon as possible, and will have the first generating unit in operation in the summer of 1925, company officials announce.



View of the downstream face of the Hetch Hetchy Dam, which is practically complete. Plans call for the completion of Moccasin Creek power house, a part of this project, within eighteen months.

Committees for Ogden Engineers Are Named by Directors

At the meeting of the Ogden, Utah, chapter of the American Association of Engineers, held on Feb. 9, Herman J. Craven, the new president, was formally installed, together with the new directors.

The new president announced the following committees which have been named by the directors:

Qualifications, O. C. Lockhart, chairman; W. S. Craven, M. D. Williams, Ora Bundy and R. H. Whitmeyer; membership, John Brown chairman, K. C. Wright, Glen Maw and H. M. Shank; legislative and ethics, E. E. Kidder, chairman, H. S. Irwin and J. M. Tracy; nominating, L. E. Peterson, chairman, W. S. Craven, R. Pearson, B. W. Matteson and J. L. Scudder; publicity, C. W. Cross, chairman, J. C. Brown, L. E. Peterson, Ora Bundy, W. S. Craven; industrial, R. E. Bristol and L. W. Beeson; education, R. H. Shoemaker, chairman, A. K. Andrews; employment, K. B. Campbell and A. W. Grix; greeters, Ora Bundy, C. A. Lund, M. D. Williams and B. W. Matteson; entertainment, J. C. Brown, chairman, Ernest Gilgen and A. W. Grix.

Campaign Budget Requirements for 1923 Are Discussed

Budget requirements to meet the enlarged program of activities for the current year were discussed at the meeting of the Advisory Committee of the California Electrical Cooperative Campaign held in Los Angeles March 5, 1923. The tentative budget as adopted by the committee follows:

Salaries of seven field representatives	$20,700
Traveling expense of field representatives	6,000
Executive expense	6,000
Office rent—San Francisco and Los Angeles	2,400
Office salaries—San Francisco and Los Angeles	3,600
Stationery, printing and postage	500
Advertising and publicity	5,000
Telephone and telegraph	500
Five illuminated billboards	3,000
Transportation of exhibits and exhibit expense	2,500
	$50,200

Three field representatives are to be employed, together with a stenographer, to be located in the Los Angeles office of the Campaign. The budget estimate is based upon the experience of the past year and is sufficiently flexible to include seasonal advertising campaigns of state-wide interest, such as a Christmas campaign and June Bride Week activity.

Plans for June Bride Week, which was one of the outstanding activities of the Campaign during the past year, are already under way and a definite announcement of the program to be followed this year will be forthcoming following the next meeting of the Advisory Committee in San Francisco on April 6, 1923.

The new constitution and bylaws of the organization which are in the process of preparation were also tentatively considered. It is the aim of the Advisory Committee to have these ready for distribution to the members as soon as possible.

Transmission Line to Be Built Over Sierra Nevadas

An agreement between the Pacific Gas & Electric Company and the Truckee River Electric Company for the construction of a transmission line over the Sierra Nevada Mountains has recently been reached, according to E. W. Florence, manager of the Sacramento division of the Pacific Gas & Electric Company. The Truckee Electric Company serves a mining load in the Comstock district and the revival of mining there has greatly increased the demands on the company.

To meet this increased demand arrangements have been made for the Pacific Gas & Electric Company to supply additional power to the Nevada company. A line will be constructed from Drum Power House on Bear River, near Towle, Calif., over the summit of the Sierra Nevada Mountains and will connect with the lines of the Truckee Electric Company at Verdi, Nev. The construction of the lines over the mountains will have to be of extremely rugged nature because of the heavy snows in the region, the snow often reaching a depth of from five to twenty ft. The lines of the Truckee company will have to be increased in size in order to care for the larger load that will be handled by the company. The Truckee Electric Company now serves the cities of Reno, Carson, and Virginia City and the surrounding territory.

Committees Appointed to Aid in Arranging Radio Show

Members of the San Francisco Electrical Development League recently received definite confirmation from the American Radio Exposition Company, Inc., of New York, that the Radio and Electrical Exposition planned for the Pacific Coast, would be held in the Civic Auditorium in San Francisco. J. C. Johnson, the San Francisco representative of the organization, addressed the members of the league and stated that his company had decided that San Francisco was the most suitable place for the exposition because of its central location. He claimed that the exposition would surpass anything of its kind ever attempted by the electrical industry in the West.

An advisory committee was appointed following the luncheon meeting and the members will aid the exposition company in establishing the show. Mr. Johnson was made chairman of the committee. This committee will advise the exposition managers of the feelings of the San Francisco Electrical Development League and similar societies.

The personnel of the San Francisco advisory committee includes Louis F. Leurey, president of the San Francisco Electrical Development League; J. Mahoney, secretary and treasurer of the San Francisco Electrical Development League; H. C. Hopkins, president of the Pacific Radio Trade Association; R. E. Fisher, Pacific Gas & Electric Company; Earl Browne, president California State Association of Electrical Contractors and Dealers; O. H. Miller, vice-president, Pacific Radio Trade Association; Victor Lemoge, president, San Francisco Association of Electrical Contractors and Dealers; A. E. Rowe, Garnett Young Company; Max Lowenthal, secretary and treasurer, Pacific Radio Trade Association; R. D. Oyler, treasurer, California State Association of Contractors and Dealers; A. H. Halloran, "Radio Magazine"; E. Martin, vice-president, San Francisco Association of Electrical Contractors and Dealers; J. W. Redpath, secretary, California State Association of Electrical Contractors and Dealers; C. L. Chamblin, California Electrical Construction Company; and A. Elkins, secretary, San Francisco Association of Electrical Contractors and Dealers.

A committee has also been appointed by the league to handle the league's activities in connection with the exposition which will be held the week of April 3. Members of this committee are: A. E. Rowe, Garnett Young Company, chairman; C. L. Chamblin, California Electrical Construction Company; M. W. Scanlon, Westinghouse Electric & Manufacturing Company; V. W. Hartley, California Electrical Co-operative Campaign; N. S. Gallison, "Journal of Electricity and Western Industry"; and Arthur Dahl, C. W. Dahl & Son.

Extensive improvements amounting to $175,000 in transmission line and generating equipment is about to be made by the Mountain States Power Company, as announced by C. M. Brewer, vice-president and general manager of the company. These betterments are needed to care for rapidly increasing load on the system and to insure service in case of failure of the new Copco high line. The auxiliary power plant at Albany will be enlarged at a cost of $75,000. A 60,000-volt line will be built from Albany to Independence at a cost of $60,000. Insulators on the 60,000-volt line between Springfield and Albany are to be entirely replaced with larger units and will cost $40,000 when completed. This last named improvement is well under way.

The Northwestern Electric Company of Portland, Ore., is installing a new $50,000 substation at Vancouver, Wash. The company plans to spend in the neighborhood of $75,000 in bringing a 66,000-volt transmission line from Camas, Wash., to Vancouver.

Power Development Plans Given Approval by Commission

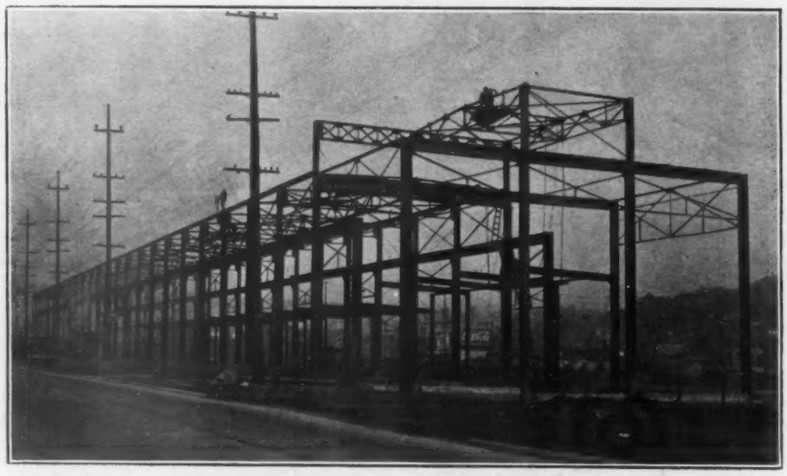
Approval has been given the hydroelectric development plans of Lars Jorgensen of San Francisco, by the Federal Power Commission at Washington, D. C. It is the purpose of the Middle Fork Development Company, for which Mr. Jorgensen is chief engineer, to develop approximately 350,000 hp. of electrical energy.

The federal permit gives the company the right to construct an impounding reservoir on the Middle Fork of the Feather River. The company has plans to erect six hydroelectric plants, with a generating capacity of 201 000 hp., and eventually 350,000 hp. Three reservoirs are also planned.

The initial work will be done at Bear Creek, a few miles from Oroville, Calif., near Berry Creek station on the Western Pacific railroad. A power plant capable of developing 48,000 hp. will be constructed there at a cost of about $5,000.000. According to Mr. Jorgensen, work will be started in the spring of 1924.

The British Columbia Electric Railway Company has sold its interest in the railway from Port Moody to Coquitlam Lake, a standard gage line, eight miles long, to Thurston & Flavelle, of Port Moody. The railway was built during the construction of the Coquitlam dam for the joint use of the British Columbia Electric and the McNair Lumber Company, the former using it to take supplies to the dam and the latter to bring logs out. The McNair company's interest in the line subsequently was leased to the Canadian Robert Dollar Company, which now has relinquished its lease to Thurston & Flavelle. The consideration received by the British Columbia Electric was $50,000.

Immediate construction of the plant of the Columbia Steel Corporation has been ordered. The blast furnace and coke oven plant to be built will be located between Provo and Springville, Utah. The company hopes to be producing pig iron by March, 1924.



First unit of three major ones to be constructed by the Washington Iron Works, of Seattle, Wash., to be used by the company in manufacturing logging equipment, hoisting engines, boilers, tanks, and iron and steel castings. The first unit will be used as a boiler shop. Electricity will play an important part in the driving mechanism which will be installed in the entire plant. The plant will cost in the neighborhood of $1,000,000 when completed.

Great Western Power Plans Third Unit in Caribou Plant

Plans for the immediate installation of a third unit of 22,000-kw. capacity in the Caribou plant on the North Fork of the Feather River have been announced by J. B. Black, general manager of the Great Western Power Company of California. The addition to the generating capacity of the company will entail the expenditure of approximately $1,500,000.

Surveying parties are already in the field and preliminary engineering work under way. Bids for hydraulic and electrical equipment will be called for within the next 15-30 days. The installation will include penstock, turbine, generator, exciter, transformers and other electrical equipment. Tunnels and transmission lines are already completed.

Increased load demands constitute the reason for the enlargement of the plant. At the present rate of growth the added power will be required within a year and it is expected that the installation will be completed within that time.

The present Caribou plant was placed in operation in the summer of 1921. The equipment includes two 30,000-hp. double overhung impulse wheels operating under a head of 1,008 ft., and two 11,000-volt, 22,223-kva. generators. The ultimate capacity of the plant is six such units.

Reports for Convention Will Be Selected at Meeting

Reports which are to be presented at the annual convention of the Pacific Coast Electrical Association in San Francisco, June 19-22, 1923, will receive final consideration at a meeting of the Technical Committee of the organization to be held at Hotel Fresno, Fresno, Calif., March 20-22, 1923. In addition to the general committee report there will be the reports of the following sub-committees: Apparatus, Hydraulic Power, Inductive Interference, Meter, Overhead Systems, Prime Movers, Power Factor, Safety Rules and Underground Systems.

The Technical Committee is composed of the following: L. J. Moore, San Joaquin Light & Power Corporation, Fresno, chairman; H. L. Doolittle, Southern California Edison Company, Los Angeles, vice-chairman; C. E. Schnell, San Joaquin Light & Power Corporation, Fresno, secretary; P. O. Crawford, California Oregon Power Company, Medford, F. O. Dolson, Southern Sierras Power Company, Riverside, E. N. D'Oyly, Western States Gas & Electric Company, Stockton, C. A. Heinze, Bureau of Power and Light, Los Angeles, Lloyd Henley, California State Railroad Commission, San Francisco, J. P. Jollyman, Pacific Gas & Electric Company, San Francisco, S. J. Lisberger, Pacific Gas & Electric Company, San Francisco, W. P. L'Hommedieu, Westinghouse Electric & Manufacturing Company, San Francisco, R. S. Masson, Arizona Power Company, Prescott, H. Michener, Southern California Edison Company, Los Angeles, R. C. Powell, Pacific Gas & Electric Company, San Francisco, T. W. Snell, Coast Valleys Gas & Electric Company, Salinas, E. R. Stauffacher, Southern California Edison Company, Los Angeles, E. E. Valk, General Electric Company, Los Angeles, W. R. Van Bokelen, Coast Counties Gas & Electric Company, San Francisco, P. M. Wentworth, Truckee River General Electric Company, Reno.

Chairmen of the various subcommittees follow:

Apparatus, R. H. Halpenny, Southern Sierras Power Company, Riverside; Hydraulic Power, H. L. Doolittle, Southern California Edison Company, Los Angeles; Inductive Interference, J. E. Woodbridge, Ford, Bacon & Davis, San Francisco; Meter, W. H. Talbott, San Diego Consolidated Gas & Electric Company, San Diego; Overhead Systems, J. A. Koontz, Great Western Power Company, San Francisco; Prime Movers, E. A. Quinn, San Joaquin Light & Power Corporation, Fresno; Power Factor, R. C. Powell, Pacific Gas & Electric Company, San Francisco; Safety Rules, R. R. Cowles, Pacific Gas & Electric Company, Oakland; Underground Systems, E. R. Northmore, Los Angeles Gas & Electric Company, Los Angeles.

Plans have recently been announced which call for the erection of a market terminal for the wholesale fruit and produce business of San Francisco. The buildings to house the wholesale markets will cost in the neighborhood of $500,000 and the entire project will entail an expenditure of approximately $2,000,000. The market will have access to both rail and deep water transportation facilities and it is expected that nearly $1,000,000 cartage charges will be saved when the new site is completed.

The public utilities commission of Utah has issued an order approving an adjustment contract made between the Utah Power & Light Company and the Salt Lake Pressed Brick Company, covering electric service rendered the latter company. The former contract between the two companies was in question during the long-continued special contract and power rate cases heard before the commission over a period of several months, and decided early in 1921. At that time, however, the commission reserved jurisdiction over several contracts, including that of the Salt Lake Pressed Brick Company, which matter has since been awaiting adjustment.

The Seattle Municipal Railways, on March 1, returned to the 5-cent cash fare, with a charge of 6¼ cents where a transfer is required. Street railway officials are confident that the reduced fare will result in largely increased traffic, and D. W. Henderson, superintendent of railways, is prepared to increase the railway service 20 per cent, if the traffic warrants it. The first few days of the 5-cent fare showed a material increase in riders, especially on the short-haul lines. Fares on the municipal buses operated in connection with the street railway system, have also been reduced from 10 cents to 5 cents, with transfer privileges.

The Pacific Telephone and Telegraph Company has acquired property located at Fourth and Court Streets at The Dalles, Ore., for the construction of a new home for the Wasco County plant. This will be a one-story building of the most modern type.

Petitions Filed for Power and Transmission Projects

Two applications for transmission line licenses in the western states were received by the Federal Power Commission in the second two-weeks' period in February. The Southern California Edison Company has applied for a license for a branch of its 220,000-volt line from the power houses in the headwaters of the San Joaquin River, to Los Angeles. The branch leads from this line to the Laguna-Bell substation in the outskirts of Los Angeles. A short transmission line from the connection with the system of the Middle Yuba Hydroelectric Company to the Brush Creek mine of the Ante Up Mining Company in Sierra County, California, is the subject of an application filed by the mining company.

A petition for a preliminary permit for two projects has been filed by G. Henry Stetson. The first project contemplates the construction of a rock-fill dam 70 ft. high at Bulls Head Rock, in the Colorado River near the southern point of Nevada, at which point it is proposed to develop 168,000 hp. Power from this first project will be used in constructing the second one, which will be located at Boulder Canyon. There a rock-fill dam 1,064 ft. above the present water level is contemplated. This dam would impound 155,000,000 acre-feet of water. The applicant proposes to develop 1,600,000 hp. to be marketed in the Southwest.

The commission recently granted a six-months' extension of time to James B. Girand, of New York, on his application to erect on the Colorado River a 200,000-hp. hydroelectric plant at Diamond Creek, Ariz. The extension was made pending disposal of legal complications as to jurisdiction on the river.

Pacific Gas & Electric Company Buys Control of Utility

Control of the properties of the California Telephone & Light Company of Santa Rosa, Calif., a $10,000,000 utility supplying electric power, light and telephone service to consumers in Napa, Sonoma, Lake and Mendocino counties, has been acquired by the Pacific Gas & Electric Company of San Francisco. The transaction does not involve the exchange of cash but is based on the transfer of stock from the Pacific Gas & Electric Company to stockholders of the smaller utility. The purchase of the company must receive the sanction of the California State Railroad Commission.

The California Telephone & Light Company owns and operates electric light and power distribution systems and telephone circuits in a rich and partially developed section north of San Francisco Bay, which includes, among other communities, Sonoma, Calistoga, Healdsburg, Cloverdale and Lakeport. It has no generating facilities, purchasing all of its power wholesale from the Pacific Gas & Electric Company and the Snow Mountain Power Company.

The company was organized in 1911, taking over the property formerly belonging to the Sonoma Valley Light & Power Company, Russian River Light & Power Company, Clearlake Consoli-

dated Telephone & Telegraph Company, Northwestern Electric Company, Healdsburg Telephone Company, Northwestern Telephone & Telegraph Company, and the Gold Ridge Improvement Company. Later it acquired the Cloverdale Light & Power Company and the Mt. Konocti Light & Power Company.

The officers of the company are Leonard Howarth, president; F. P. Doyle, vice-president; Leo H. Sussman, second vice-president; W. P. Ferguson, secretary-treasurer and general manager, and A. J. Lyon, assistant secretary and auditor.

The consolidation will add to the lines of the Pacific Gas & Electric Company a total of 9,000 consumers, 2,400 of whom are telephone subscribers. It will not only offer a large, new and hitherto only partially developed outlet to this company, but with the greater resources and progressive policies of the larger utility, the consolidation should mean much for the future development of the territory involved.

Demand for New Water Rights in California Is Heavy

Twenty-five applications for permits to appropriate water in the state of California were received by the State Department of Public Works, Division of Water Rights, during February. Most of the applications were for water to be used for agricultural purposes. Several applications requested water for use in mining operations.

H. L. Shannon of San Francisco, made application for a permit to appropriate 150 sec.-ft. of water from the Sacramento River in Tehama County. Mr. Shannon proposed to use the water in developing approximately 10,200 hp. of electrical energy. A ditch and flume ten miles in length is also contemplated, the estimated cost of the entire project being $650,000.

A request was made by W. H. Samson of Corning, for permit to use 1,250 sec.-ft. and 200,000 acre-feet of water from Clear Creek to be diverted in Shasta County for developing power. The application states that it is proposed to develop 128,000 hp.

During the same month twenty-seven permits were issued to residents of the state for use of water. Only two of this number are of any marked importance as regards the development of hydroelectric power. P. B. Cross, Mills Building, San Francisco, was issued a permit to appropriate water from Deer Creek, in Tehama County, for developing approximately 18,600 hp. The permit gives the right to use 150 sec.-ft. of water from the stream and states that the estimated cost of the development is $1,669,648.

The Utica Mining Company, Mills Building, San Francisco, was issued a permit to use 6,144 acre-feet of water per year from Highland Creek in Tuolumne and Calaveras counties, in developing about 3,300 hp. The estimated cost of the project is $150,000.

The town of Chandler, Ariz., is contemplating the installation of an ornamental street lighting system along with a municipal light and power distribution system for which two-phase energy will be purchased. An election will be held soon to allow the citizens of the town to vote on the issuance of bonds.

Lumber Company Water Rights in Shasta County Sold

Through two deeds recently filed in Shasta County, California, the Mount Shasta Power Company, a subsidiary of the Pacific Gas & Electric Company, received title from the Red River Lumber Company to all of the water rights on Hat Creek, Fall River and on Pit River from the mouth of Fall River to Big Bend, forty miles below. The cash consideration was $2,830,000.

Included in the transactions were power houses known as Hat Creek No. 1 and Hat Creek No. 2, which were deeded to the Red River Lumber Company and were leased to the power company in return for 3,500 hp. to be delivered to the lumber company as it may be needed.

Advisory Committee of Campaign Makes Plans for 1923

Plans for the California Electrical Cooperative Campaign for the coming year were explained to a group of the leaders in the electrical industry in southern California at a meeting held at the University Club, Los Angeles, on March 5, 1923. Members of the Advisory Committee were in attendance.

Included among those who addressed the meeting were R. E. Fisher, chairman of the Advisory Committee, K. E. Van Kuran, vice-chairman of the committee, R. E. Eltringham, manager of the Campaign, R. H. Ballard, A. E. Wishon, D. E. Harris, H. L. Harper, H. L. Miller, H. H. Courtright, H. B. Woodhill, and W. C. Wurfel.

Others who were in attendance were H. G. Holabird, D. C. Pence, H. E. Sherman, Jr., C. A. Renard, J. O. Case, A. L. Spring, H. H. Walker, N. W. Graham, J. N. Kelman, R. E. Smith, P. G. Gough, H. W. Allen, W. L. Frost, C. C. Hillis, J. G. Pomeroy, H. M. Pomeroy, S. W. Murray, C. B. Hall, G. C. Tenney, W. A. Knost, J. L. Kline, Ross Hartley, J. C. Jones, P. H. Booth, Frank Weiss, G. E. Arbogast, A. B. Vandercook, R. C. Spilsbury, J. H. Jamison, F. J. Airey, W. R. Dorsberg and E. R. Northmore.

The City of Sacramento, Calif., is considering the organization of a district for the development and distribution of electric energy in connection with the Silver Creek project. It is the purpose of the city manager to interest the people of the city in the erection of a municipally owned hydroelectric plant. The plans made by the city council call for the proceeding under what is known as the Municipal Utility District Act, which permits such districts to incur bonded indebtedness for the acquisition and construction of works and property.

H. Austin Adams was the principal speaker at the last monthly evening meeting of the San Diego Electrical Club, held at the San Diego Hotel, San Diego, Calif. A number of men from the electrical industry who have been unable to attend the noon-day meetings were present at the evening meeting. It is the policy of the club members to bring at least one guest per member to these meetings.

The phases of service and marketing of electricity by the power company were discussed by the Commercial Committee of the Pacific Coast Electrical Association at the meeting held in Fresno, Calif., on Feb. 10. Those attending the meeting were: (top row left to right) J. F. Anderson, Southern California Edison Company; R. I. Carruthers, Southern California Edison Company; M. E. Newlin, San Joaquin Light & Power Corporation; E. M. Westhoven, Southern California Edison Company; (second row from top) J. E. Barrett, San Joaquin Light & Power Corporation; E. N. Britton, San Joaquin Light & Power Corporation; I. P. Maines, Southern California Edison Company; H. C. Rice, Southern California Edison Company; Howard Douglas, Southern California Edison Company; (third row from top) Don C. Ray, Pacific Gas & Electric Company; O. S. Clifford, Truckee River Power Company; J. S. Moulton, San Joaquin Light & Power Corporation; N. S. Eichelberger, San Joaquin Light & Power Corporation; F. O. Sievers, General Electric Company; H. A. Cram, Landers, Frary & Clark; F. S. Hamilton, Southern California Edison Company; (bottom row) H. E. Sandoval, Pacific Gas & Electric Company; A. M. Frost, San Joaquin Light & Power Corporation; P. B. Wilson, San Joaquin Light & Power Corporation; A. H. Nicoll, Western Electric Company; J. W. Wrenn, Great Western Power Company; R. C. Bragg, Vallejo Electric Light & Power Company; and Ernest M. Frellson, Coast Valleys Gas & Electric Company.

Meetings

Pacific Coast Convention Plans to Be Made in April

Plans for the annual convention of the Pacific Coast Electrical Association affiliated with the National Electric Light Association, will be discussed at a meeting of the executive committee of the organization, to be held in Los Angeles during April. The convention will be held in San Francisco June 19-22, 1923. Those comprising the executive committee are J. B. Black, Great Western Power Company, president; L. M. Klauber, San Diego Consolidated Gas & Electric Company, vice-president; William Baurhyte, Los Angeles Gas & Electric Company, vice-president; J. V. Anthony, General Electric Company, treasurer; Samuel H. Taylor, secretary; A. B. West, Southern Sierras Power Company, G. E. Arbogast, Newbery Electric Company, Los Angeles; R. A. Balzari, Westinghouse Electric & Manufacturing Company, San Francisco; S. Waldo Coleman, Coast Counties Gas & Electric Company, San Francisco; E. B. Criddle, Southern Sierras Power Company, Riverside; H. L. Harper, Western Electric Company, Los Angeles; A. N. Kemp, Southern California Edison Company, Los Angeles; F. A. Leach, Jr., Pacific Gas & Electric Company, San Francisco; R. S. Masson, Arizona Power Company, Prescott; H. R. Noack, Pacific States Electric Company, San Francisco; Robert Sibley, consulting editor, McGraw-Hill Company, San Francisco; A. Emory Wishon, San Joaquin Light & Power Corporation, Fresno.

The annual convention of the Northwest Electric Light and Power Association will be held in Seattle June 27-30, 1923. The program for the convention is in the process of preparation and will be announced in the near future. It is planned to make this year's gathering the most noteworthy in the history of the organization. The committee which is in charge of the program follows: Norwood W. Brockett, Puget Sound Power & Light Company, chairman; R. M. Boykin, North Coast Power Company, Portland, L. A. Lewis, Washington Water Power Company, Spokane, George L. Myers, Pacific Power & Light Company, Portland, and George F. Nevins, Pacific Power & Light Company, Portland.

At the seventeenth annual convention of the Oregon Retail Hardware and Implement Dealers' Association, held in Portland, recently, the sale of electric devices by hardware men was given a prominent place in the program. Ray W. Turnbull, northwestern representative of the Edison Electric Appliance Company, devoted an hour to the subject, "Should the Hardware Dealer Sell Electrical Household Appliances?" and his message was well received. The remarkable thing is that this subject has not always been considered of sufficient general interest to justify its presentation at a convention.

As one of his first official acts, J. F. Zwiener, newly elected president of the Electric Club of San Diego, Calif., recently appointed the standing committees for the coming year. The following committeemen were appointed: program, entertainment, fraternal and attendance: Herbert Rose, G. P. Winn, Evan Shaffer; publicity and public education: A. N. Clark, R. H. Taber, C. C. Clardy; electrical development: Bert Johnstone, Carl Heilbron, L. M. Klauber; electrical home: A. E. Holloway, Frank Munro, Bruno Barth, George Garrettson, Walter Wurfel; membership: G. H. P. Dellman, Harold Dodge, Charles Dent; visiting and relief: W. H. Talbot, George Garrettson, A. L. Wilhelm; slogan, emblem and roster: R. C. Cavell, Sam Hall, Frank Carlson; better business methods: A. E. Holloway, Frank Munro, Walter Wurfel.

For the purpose of considering and discussing the uniform classification of accounts for electric utilities as recommended by the National Association of Railway and Utilities Commissioners, a meeting was held in Denver, recently, under the auspices of the Colorado Public Utilities Commission. Representatives of all the leading central stations in the state were present and it is understood that approval was given to the plan insofar as standardization of accounts was concerned.

A large electric sign whose letters make up the phrase, "Have Faith. Smile and Rebuild," which was donated to the citizens of fire swept Astoria, Ore., by a San Francisco sign company, has arrived in the city and will be immediately located in the heart of the burned business district. The sign will be erected under the auspices of the Kiwanis Club, the work to be done free of charge by the linemen of the Pacific Telephone & Telegraph Company, and the electricity will be furnished free for the sign by the Pacific Power & Light Company.

COMING EVENTS

American Society of Mechanical Engineers—
Pac. Coast Regional Meeting—Los Angeles, Calif.
Apr. 16-18, 1923

National Electric Light Association—
Annual Convention—New York, N. Y.
June 4-8, 1923

Pacific Coast Electrical Association—
Annual Convention—San Francisco, Calif.
June 19-22, 1923

American Institute of Electrical Engineers—
Pacific Coast Convention—Del Monte, Calif.
Sept. 26-29, 1923

The Northwestern Redwood Company was recently authorized by the California Railroad Commission to sell its electric distributing system located in Willits, Calif., to the Willits Water & Power Company for $23,500 plus the cost of additions and betterments installed since Nov. 1, 1922. The Willits Water & Power Company was also authorized to acquire the property and to sell it, together with its water properties, to the Central Mendocino County Power Company for $90,000 plus the cost of additions and betterments installed since the same date.

Los Angeles Club Sees Portable Show Window Display

The Electric Club of Los Angeles celebrated Merchants' Day on Feb. 26, and at that time witnessed the portable window display designed by the California Electrical Cooperative Campaign. The display window was equipped and decorated by Barker Brothers, furniture house, and Clark Baker demonstrated the window. Robert Eltringham, manager of the Campaign, discussed the application of modern illumination to stores and show windows.

To enable the large crowd, in attendance at the meeting, to hear the speakers plainly, Western Electric public address system was installed in the ball room of the Hotel Alexandria. This system was first successfully tried out in Los Angeles at the Chamber of Commerce banquet. The new device proved to be very interesting to the men assembled at the meeting.

The February joint meeting of the Portland sections of the American Institute of Electrical Engineers and National Electric Light Association was held Feb. 20 in the employees' club room of the Pacific Telephone & Telegraph Company. As the guests of the telephone company the large audience was first told various phases of the tremendous job completed on Jan. 27, when the company in a single night cut over 12,000 subscribers from manual to machine switching stations. Afterwards, under the guidance of a corps of able telephone men the guests were divided into groups and escorted through all departments of the big telephone building, where they were given opportunity to see a big exchange in operation.

As evidence of its good will and interest in the many advertising people who attended the recent 14th district convention of the Advertising Clubs of the World in its city, the Denver Gas & Electric Light Company entertained the delegates at a dinner dance held quite recently at the Denver Motor Club mountain club house in Bear Creek Canyon. Clare N. Stannard, vice-president and general manager, and George W. Bixler, director of publicity for the company, acted as hosts.

According to a report recently made public by the Washington State Department of Pubilc Works, privately owned public utilities in Washington during 1921 paid 14.96 per cent of their gross revenues in taxes to the state. Steam railroads paid the highest percentage of their revenues and the total amount paid by the utilities was $11,143,940.81. Electric companies paid the second highest percentage of gross receipts with a total of $1,556,381.86 or 9.6 per cent of gross revenues.

Ogden and Salt Lake City, Utah, have recently been given the opportunity to purchase the rights of the Great Basin Power Company on the Duchesne River. H. A. Strauss, vice-president and chief engineer of the company has made the offer to the two cities with the suggestion that they operate municipally owned light and power systems. The proposal was set aside until future meetings by the city councils.

Personals

R. U. Muffley, formerly superintendent of light and power, Bellingham division, Puget Sound Power & Light Company, has been named manager of the Washington Coast Utilities' properties recently acquired by the Seattle company. These properties, consisting of electric, gas, telephone, water and ice companies in seven cities, will be operated as a separate unit under the direction of Mr. Muffley. Mr. Muffley was born in Fairmont, Minn., in 1883 and educated in the public schools of that city. After being graduated from the Tolands Business College of La Crosse, Wis., he became associated with the Fairmont Electric Light Company. He same West in 1903 and took a position with the Globe Electric Company of Seattle, engaged at that time in miscellaneous construction operations. Early in 1904 he went to Bellingham and became affiliated with the Whatcom County Railway & Light Company as motor repairman and wireman. In 1906 he was promoted to foreman of inside construction and motor repairs. In 1908 Mr. Muffley was named superintendent of distribution and in 1911 was again promoted to the position of superintendent of light and power in charge of all light and power plants, street railways and gas plants owned by the corporation in this district. He held this position until his promotion and transfer to his present post.

R. U. MUFFLEY

Robert C. W. Libbey, of San Francisco, Western States sales representative of the Simplex Electric Heating Company, has been in Los Angeles for a few weeks going over the territory with members of the Reiman Wholesale Electric Company, local jobbers of Simplex heating appliances.

Will H. Gibson of Mountain Home, Idaho, has been named to the Idaho Public Utilities Commission, to succeed George E. Erb, whose term expires April 1.

V. S. McKenny of the NePage-McKenny Company, Seattle, was in San Francisco recently to attend the funeral of L. L. Brown.

R. E. Fisher, vice-president in charge of sales, Pacific Gas & Electric Company, has been named vice-general chairman of the Joint Committee for Business Development. Other western men who have been appointed to the personnel of the organization include **H. J. Gille**, sales manager, Puget Sound Power & Light Company, **C. C. Hillis**, vice-president and treasurer, Electric Appliance Company, San Francisco, **S. M. Kennedy**, vice-president in charge of public relations, Southern California Edison Company, and **W. R. Putnam**, vice-president and general manager, Idaho Power Company.

W. E. Barrett, formerly of the Denver Gas & Electric Light Company, has been appointed to the publicity department of the Westinghouse Company in the Rocky Mountain region with headquarters in Denver.

A. T. Goward, manager at Victoria, B. C., for the British Columbia Electric Railway Company, Ltd., recently spent several days in California conferring with central station executives.

Charles E. Wiggin, manager of the electrical department of Dunham, Carrigan & Hayden Company, San Francisco jobbers, has resigned to join the sales department of the Pacific States Electric Company. Mr. Wiggin is one of the best known figures in the jobbing industry in the West and for the past year he has served as chairman of the Pacific Coast Division of the National Electrical Supply Jobbers' Association. Mr. Wiggin is a native of San Francisco. During his career in the electrical industry he has been engaged in every phase of the business except the engineering branch. Nineteen years ago he became associated with Will & Fink, electrical contractors, and engaged in construction work of every character. Later he became secretary of the San Francisco Electrical Contractors' Association and served in this capacity for several years. Subsequently he was employed in the San Francisco office of the Western Electric Company as chief clerk and later with the John R. Cole Company, manufacturers' agents. He joined Dunham, Carrigan & Hayden Company in 1910 and has advanced steadily until, at the time of his resignation, he was head of the electrical department.

CHARLES E. WIGGIN

Louis F. Leurey, prominent consulting electrical engineer of San Francisco, has been elected president of the San Francisco Electrical Development League for the coming year. He is an outstanding figure in the electrical industry of the West and has been one of the most active members of the Development League. During the past year he has acted as vice-president of the organization and chairman of the program committee. Mr. Leurey is a graduate electrical engineer from Tulane University of Louisiana with the class of 1902. His first connection with the electrical industry was in the testing department of the General Electric Company. From 1904 to 1913 he held important engineering positions with the following companies: New Orleans Railway & Light Company, Spokane & Inland Railway and British Columbia Electric Railway, Ltd. Mr. Leurey is perhaps best known through his connection with the Panama-Pacific International Exposition, where as assistant chief mechanical and electrical engineer, he had charge of all field installations and operations. Since 1917 he has been engaged in consulting electrical engineering work with offices in San Francisco. He has been instrumental in the design of many electrical installations in western industrial plants and mines. He is a member of the American Institute of Electrical Engineers and the American Association of Engineers. With his wide acquaintanceship and deep-rooted interest in the affairs of the Electrical Development League, his inauguration promises to be one of the most noteworthy in the history of the organization.

LOUIS F. LEUREY

Claude Mitchell, of the Board of Underwriters of the Pacific, is in the East attending the meetings of the committee which is revising the present national electrical code.

D. W. Hooper and **M. L. Hooper**, formerly of San Francisco, are now located in Los Angeles where they have established a branch of the Wessix Electric Heaters, with which firm they have been connected for the past several years.

Carl M. Heintz, manager, publicity department, Los Angeles office of Westinghouse Electric & Manufacturing Company, recently spent a week in San Francisco going over plans and appropriations for the coming year with the San Francisco representative.

Richard Sachse, chief engineer of the California State Railroad Commission, resigned from that position on March 1, 1923, to engage in consulting engineering work in Los Angeles. He has been with the California Commission since 1912 and has held the position of chief engineer since 1914. During that time he has handled many important engineering matters which have come before the commission, including the valuation of the Los Angeles city distribution properties of the Southern California Edison Company, and valuation of the

RICHARD SACHSE

properties of the Pacific Gas & Electric Company, Great Western Power Company and Southern California Edison Cofpany. Mr. Sachse is a graduate civil and structural engineer. He did railway, hydraulic, electrical and harbor engineering work in West Africa, Belgium, Germany and Norway before coming to the United States in 1903. Since that time he has been connected in an engineering capacity with the Western Electric Company, United States Steel Corporation, United States Reclamation Service, Southern Pacific and Western Pacific railways. He was recently appointed chairman of the Engineering Advisory Committee in connection with the railroad valuations being made by the Interstate Commerce Commission. His work as chairman of the Inductive Interference Committee is well known to the electrical industry. After leaving the Commission his first work will be a comprehensive investigation of the street railways of Los Angeles with a view of bringing about a unification of the two systems in that city.

James W. Kuse, formerly of the Rocky Mountain district of the Edison Electric Appliance Company, has just recently been transferred to the Los Angeles district of that company as sales representative.

T. A. Brooke, sales manager, Illinois Electric Company of Chicago, is in Los Angeles on a visit. Mr. Brooke has been quite active in the affairs of the Electric Club of Chicago and was a member of the executive committee during the past year.

F. J. McEniry, field representative of the Denver Electrical Cooperative League, has received a commission as a lieutenant in the military intelligence section of the officers' reserve corps, according to recent orders of the adjutant-general of the army.

B. C. J. Wheatlake, supply manager of the General Electric Company in the Rocky Mountain district, with headquarters in Denver, was a California visitor after attending the annual convention of the New Mexico Electrical Association in Aubuquerque, where he was one of the chief speakers. Other members of the Denver contingent to attend the convention were **A. C. Cornell** of the Western Electric Company, **J. C. Davidson** of the Hendrie & Bolthoff Manufacturing & Supply Company, **G. O. Hodgson** of the Edison Lamp Works, **George E. Lewis** of the Rocky Mountain Utilities Committee, and **J. F. Greenawalt** and **Joseph Moorhead** of the Mountain States Telephone & Telegraph Company.

Kenneth M. Cross, formerly in business for himself in Portland, Ore., has just recently moved to Los Angeles and is now connected, as a salesman, with the firm of C. W. Cole & Company, manufacturers of reflectors and other equipment for store and show window lighting.

Richard E. Smith, advertising manager of the Southern California Edison Company, has been inaugurated president of the Los Angeles Electric Club for the coming year. He has been one of the outstanding figures of the club during the two years of its existence and his rise to the presidency has been marked by an unselfish desire to serve and to perform all tasks assigned to him willingly and without hope of reward. His contributions to "Sparks," the weekly bulletin of the club, has won for him a large and loyal following, and this, together with committee work and the directing of programs, has culminated in his election to the highest office in the club. Mr. Smith has been engaged in the electrical industry in California for the past seventeen years. He started as a wireman's helper in San Diego and from this beginning he held successively the positions of Pacific Coast representative of the National X-Ray Reflector Company, sales man-

RICHARD E. SMITH

ager of the Mt. Whitney Power Company, district manager, Tulare office, Southern California Edison Company, and for the past two years the position of advertising manager of that company. With a man of Mr. Smith's personality and enthusiasm at the head of the Electric Club, the organization is bound to prosper during the coming year.

Dr. Joseph Merrill, dean of the engineering college of the University of Utah, has been elected president of the Engineering Council of Utah. He has been an active figure in this organization, which is an affiliation of all of the engineering societies of Utah and which represents approximately 1,500 men of the engineering profession in that state. The Council sponsors weekly luncheons at the Salt Lake City Commercial Club at which matters of general engineering interest are discussed. Dr. Merrill received a degree of B.S. from the Uni-

DR. JOSEPH MERRILL

versity of Michigan in 1893 and continued his studies at Johns Hopkins University, receiving his Ph.D. from that institution in 1896. He was assistant professor of chemistry at the University of Utah in 1897, director of the Utah State School of Mines at the University in 1898 and since 1899 has been professor of physics and electrical engineering. He has contributed to the electrical engineering profession largely through research work. He has been very active in the Utah section of the American Institute of Electrical Engineers and during the year 1920-21 served as chairman. It was during his term of office that the Utah section acted as hosts for the national convention of the A.I.E.E. which was held at Salt Lake City.

Obituary

L. L. Brown, California representative of the H. E. Gleason Company of Seattle, one of the most active figures in the electrical industry on the Pacific Coast, died suddenly in San Francisco on March 7. Mr. Brown was a native of Duluth. He came west 17 years ago, entering the electrical industry in Spokane. Three years later he joined the Seattle office of the Western Electric Company where he remained for 12 years. He had been with the Gleason Company for the past two years. Mr. Brown, during the time he had been in California, took an active part in the affairs of the electrical industry in both San Francisco and Los Angeles. He is survived by his mother, his wife and two children. He leaves a host of friends throughout the entire Pacific Coast region.

Manufacturer, Dealer and Jobber Activities

L. A. Clark and **J. Wesley Burdsal** have opened a well equipped showroom and office at 1822 South Hope Street, Los Angeles, and will engage in all branches of illumination engineering. Mr. Clark was formerly with the Electric Appliance Shop and Mr. Burdsal was employed by the Illinois Electric Company.

The Line Material Company of South Milwaukee, Wis., has recently prepared for distribution, a booklet entitled "Traficons" which contains a description of its new system of traffic control devices. The various designs of traffic-directing devices manufactured by the company are illustrated and described.

The Huggins Electric Company is the new name of the R. C. Young Electric Company, of Trinidad, Colo., the company having been purchased by C. W. Huggins of that city. Mr. Huggins was formerly an electrical expert for the Trinidad Gas & Electric Supply Company.

H. D. Thomas, Denver manager of the **Federal Electric Company,** has stated that it is planned to organize a force in that city for house-to-house sales of the washing machines manufactured by his company.

The Robbins & Myers Company of Springfield, Ohio, has placed on the market a new line of split-phase fractional motors designed for washing machines, ironing machines and other household and office appliances. The new motors have been designed to make for low temperature rise and quiet operation and have been materially reduced in weight. At present these motors are in production in 1/6 and 1/4-hp. sizes for 60-cycle, 110-volt circuits. Direct current motors are also being produced. The company also plans to manufacture 1/10 and 1/8-hp. sizes in both a.c. and d.c. designs in the near future.

The Hubbard Machine Company, San Francisco, has recently published a booklet concerning its line of domestic water pumping units. The new pumps are designed for use where city water is not available, and where it must be secured from wells. The new pump runs entirely in oil and is automatically controlled. The new unit is now on display at the office of the company in San Francisco.

The Engineering & General Supply Company, of Los Angeles, Calif., of which J. G. Monahan is manager, has been appointed the Los Angeles district agent for the Railway & Industrial Engineering Company, of Greensburg, Pa. The agents have territory including southern California and Arizona. The Railway & Industrial Engineering Company manufactures a line of outdoor transmission switching and protective equipment.

The Panama Lamp & Commercial Company, a San Francisco firm which is headed by Joseph Thebin, is now located at 1062 Mission Street. The company was formerly situated at 595 Mission Street.

C. T. Smallcomb, an electrical contractor of Los Angeles, Calif., has recently moved to 655 Wall Street in the same city. The demand for more room for increasing business brought about the change.

The George A. Gray Company, of 910 Howard Street, San Francisco, and 236 South San Pedro Street, Los Angeles, has recently been appointed western states representative of the F. W. Wakefield Brass Company of Vermillion, Ohio.

The Wagner Electric Corporation, St. Louis, Mo., has recently published Bulletin No. 131, which is an instruction booklet for persons ordering and adjusting repair parts for Wagner single-phase motors. The booklet is well supplied with illustrations and gives the motor operator definite and adequate instructions to follow in locating the causes of trouble.

The Westinghouse Electric & Manufacturing Company representatives in the Rocky Mountain region held a sales conference in Denver, Colo., March 1-2, under the direction of the district manager, L. M. Cargo.

The Central Electric Company, of which J. M. Carlson is the manager, has moved from 185 Stevenson Street to 179 Mission Street, San Francisco. The firm specializes in contracting and merchandising of electrical equipment.

The Pacific Electric Manufacturing Company has been provided representation in Denver, Colo., by J. Ludwig Hansen, an electrical engineer of Salt Lake City, Utah, who recently opened offices in the Colorado capital.

H. G. Whitten has been placed in charge of the **Apex Electrical Distributing Company** branch in Denver, Colo., recently opened in the new Wilda Building. Seventy representatives have been appointed in the territory and sub-offices in a dozen Colorado cities are maintained. The company recently became subscribing members of the Electrical Cooperative League in Denver.

The Hendrie & Bolthoff Company, Reynolds Radio Corporation, The Winner Radio Corporation, Rocky Mountain Radio Company and the **Mine and Smelter Supply Company,** in the interests of better programs, through the radio jobbers' association of Denver, Colo., have arranged to provide regular afternoon and evening programs over the Reynolds and Winner stations under the direction of Jack O'Brien, a well known Denver promoter.

Mitsui & Company, Tokio, Japan, has just been appointed exclusive representative in Japan and China for Uehling CO_2 Recording Equipment and other Uehling power plant instruments and gages. The main office and factory of Uehling Instrument Company is in Paterson, N. J. Many Uehling installations have been made in Japan and China without the aid of local representatives but it is believed that with the cooperation of the very able engineering department of Mitsui & Company, the Japanese and Chinese Uehling customers will be served to the best advantage.

The H. M. Thomas Company, of Oakland, Calif., has recently taken over the representation of the Edwin L. Wiegand Company of Pittsburgh, Pa. H. M. Thomas is president of the firm which is located in the Oakland Bank Building in the San Francisco Bay city.

The Getz Washer Sales Company, distributors of the Getz washing machine, has recently been established at 910 South Grand Avenue, Los Angeles, Calif., under the management of Fred H. and George C. Kanne. Both men were formerly distributors of the Getz machine in Illinois.

The K-P-F Electric Company, a contractor-dealer firm of San Francisco, has recently moved from 37 Stevenson Street, to 855 Howard Street. A. S. Pahl is the proprietor of the firm.

The Chandelier Electric Manufacturing Company, is the name of a new electrical fixture manufacturing company established in Seattle, Wash., by W. F. Foster of that city. A factory and sales office have been located at 1619 Westlake Avenue. Mr. Foster was formerly of the United States electrical division at the Panama Canal.

The Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has published Bulletin No. 1632-F, which is devoted to showing various applications of the centrifugal pumps and centrifugal pumping units manufactured by the company. Illustrations in the booklet present an idea of the variety of industrial applications that may be made with the equipment and reading matter describes the pictures in an adequate manner. Applications of the company's equipment in power plants are also illustrated and described. Head capacity tables, friction tables and Weir tables are reproduced in the booklet.

When H. L. Garbutt first thought of joining the forces of the Westinghouse Electric & Manufacturing Company, he had visions of himself as he may be seen above. In reading through one of the lists of requirements for eligibility to the ranks of Westinghouse, Harry found that to be a success, it would be necessary to become a proficient golfer. Thus it was that by following the rules of the company, he came to be one of the best golfers in the electrical industry on the Pacific Coast and at the same time made himself merchandising manager of the San Francisco office. In the picture above, Harry had a hard time getting his ball out from behind the shadow, but he did it eventually and nearly qualified for the "Hole in One Club."

Trade Outlook

Los Angeles

An unexpectedly large building total for Los Angeles was rolled up in the short month of February due to the issuance of a large number of permits, which have been held back by the congestion of work in the city building department. During the month, 4,104 permits with an estimated valuation of $12,080,310 were issued, as compared with 2,842 permits with an estimated valuation of $7,579,798 for February, 1922. This is the high record for February and next to the high record for any month, which was $12,964,829 for April, 1922. For the first two months of 1923 the total is $23,338,827, an increase of $7,783,861 over the same period last year.

The above figures clearly demonstrate that Los Angeles has made a flying start toward a new record building year, and other communities of the Southland, not to be outdone by the bigger city, are coming forward with records of their own which are no less astonishing, and no less indicative of the tremendous forward strides which are being taken by all of southern California. In many of the communities a new high point for building was reached during February and there were few instances where February fell lower than second highest month.

The continued influx of people and huge building program are keeping manufacturer, jobber, central station and dealer busy. All continue to report increased sales and no signs of a let-up.

Denver

Denver, with a public building and construction program for this year of $16,000,000, takes third place in a nation-wide survey of contemplated expenditures by municipalities for public building operations, the other cities exceeding Denver in this respect being Los Angeles and New Orleans. February building permits totaled $835,000 which with the January record places the first two months of the year in excess of two million dollars.

All principal building materials are advancing in price and this upward trend is not apparently discouraging any phase of the general building program. Several wage increases have been awarded building craftsmen, and others are contemplated to be effective May 1. Prices on new houses are 10 per cent higher than last year but this increase is not reflected in the prices being obtained for electrical work.

Several heavy snow storms with the coldest weather of the season have damaged transmission lines and delayed outside construction in some areas. This has permitted local jobbers to adjust their stocks and analyze the market, especially copper. Radio is prospering, thanks to an arrangement between the leading dealers providing for attractive programs to be broadcasted every afternoon and evening.

Portland

General business conditions are good. Rapid expansion is evident in many different lines of business. Due to the severe weather one week in February, during which time practically no building permits were issued, the total value of permits issued in February in 1923 dropped about 7 per cent below the corresponding figure of a year ago. Construction work is now being pushed.

The lumber industry has now about recovered from the effects of the storm late in February. There still exists a shortage of logs which is reflected in the output of the mills.

The shipping industry of the Port of Portland is far ahead of last year at this time. Vessels are being added to all the important trade routes to care for the added cargoes. During March, 35 vessels plying between Portland and Atlantic and Gulf ports will arrive in Portland. This is 50 per cent greater than a year ago.

The Portland Chamber of Commerce reports an unprecedented number of inquiries from large concerns seeking locations and opportunities for branch factories.

Bank clearings of Portland banks during February, 1923, were $116,186,034 as compared with $103,145,607 for February, 1922. The financial conditions during 1923 are anticipated with general optimism.

Power companies are placing large orders for equipment, especially transmission material. Shipments are lengthening.

Seattle

Despite the fact that February is a short month and that the city was visited by an exceptionally severe snowstorm which temporarily halted all building activities, the month showed one of the best records for building in the city's history. Building permits for the month were valued at $2,023,250, and showed an increase of $1,412,645 over February of last year.

The month made a good showing in other lines also, with bank clearings $16,000,000 in excess of February of last year, or a total of $131,653,686.

The first nine weeks of 1923 show an increase of 15 per cent in production of lumber over any similar period in the history of the West Coast Lumbermen's Association, and manufacturers are very optimistic over the prospects for spring and summer. There are but two storm clouds on the lumber horizon, the threatened labor and car shortage, and the association is taking precautionary measures to combat these.

Electrical jobbers and retailers report a comparatively active period since the first of the year, with demand for electrical equipment showing slow but steady improvement. There has been active demand from lumber mills throughout the Northwest, and an increasing tendency to employ electricity in their operation. Retail store business is beginning to show rapid recovery from the after-season lull. Considerable equipment has been sold for repairs to electric lines throughout the state, due to the heavy snowstorm in February.

San Francisco

The importance of California as an oil supply center has been increasing lately and this fact is partly responsible for the shortage of tankers on the Atlantic seaboard. The rate of production is so high in the state at present that the demand is not expected to cut into reserve stocks. Gasoline and crude oil prices are remaining constant and it is not expected that the export demand will cause any flurry in the market.

The spring season which started the first of the month shows possibilities for an expansion in home and industrial construction. New irrigation projects are also being contemplated from several different sources. Building is increasing rapidly under the favorable weather conditions and it is thought that March will set a new record and keep up the advance that was made in February. Statistics show that during February the value of building permits issued in San Francisco came to $3,278,676, covering 782 different construction projects. This is an increase of over $600,000 over February, 1922, and also is in excess of the January total.

Business in general is in good condition in the San Francisco Bay region and electrical men feel that a prosperous spring building era is ahead of them. Architects' plans indicate that new buildings and homes will be better supplied with electrical outlets than they have been in previous years.

Salt Lake City

Immediate construction of the first unit of the Columbia Steel Corporation's blast furnace and byproduct coke oven plant between Provo and Springville, Utah, has been ordered, and ground has actually been broken. The operation of this plant, with the enlarged activities which will develop in the future, to meet the anticipated increase in demand for its product, will mark a new era in industrial development in the intermountain section.

Another healthy sign is the action of the Utah Copper Company's directors, increasing the quarterly dividend from fifty cents to one dollar. Copper mining is one of the basic industries of this section, and the continually increasing operations of the Utah company are very encouraging.

Considerable improvement in wholesale trade is reported for the intermountain territory during the past thirty days.

Electrical dealers are concentrating their efforts during the month of March on washing machine sales, and some very good results have so far been obtained.

The Retail Credit Men's "Pay Your Bills Promptly" campaign has had a marked effect on the local credit and collection situation, and considerable improvement is noted.

Increased business activity, as compared with the same period last year, is shown by a general survey of the situation, and even greater improvement is expected from now on.

Construction News

Bridges

Ore., Montesano — The Pacific Construction Company has been awarded two bridge contracts by the Grays Harbor county commissioners, one for rebuilding several small trestle bridges and the South Bay trestle near Westport, $28,723, and the other the retimbering of the bridge over the Chehalis River at Porter, costing $11,791.

Ore., Hood River—Steps are being taken for the construction of a toll highway bridge across the Columbia River connecting Hood River with White Salmon, Wash. The plans, as outlined by the engineers who propose to finance the structure by a flotation of a $275,000 bond issue, call for work as soon as the high water of the coming summer shall have subsided.

Ore., Astoria—The plans and specifications for the new Lewis and Clark span are ready for the government, according to C. B. McCullough, bridge engineer for the state highway commission. The structure will be a bascule type bridge with a draw opening of 100 ft. in the clear. Bids have been called for to be opened at the April meeting of the highway commission.

Wash., Chehalis—Lewis County commissioners have instructed the county engineer to prepare plans and call for bids for two new steel bridges in Lewis County, one across Olequa Creek and the other at Bremer.

Wash., Yakima—The state highway commission will replace the present bridge across the Yakima River at Easton, with a new steel structure.

Wash., Olympia—The state highway commission will call for bids very shortly for an overhead bridge at Kelso, two bridges between Centralia and Chehalis, and another south of Toledo in Lewis County. It is expected that the proposed $200,000 concrete bridge at La Center will be started this summer. It will be 1,100 ft. long and will be provided with sidewalks.

Wash., Aberdeen—An extensive program of bridge construction is planned for Grays Harbor County during the coming season. A contract for a $40,000 steel structure across the Humptulips River, near Wilderness, was let last month and the trestles on either side of the South Bay bridge will be rebuilt this year. The Chehalis River bridge will be rebuilt and a new bridge constructed over the Satsop River at the Dan Gleason farm. A bridge joining Grays Harbor and Mason counties at the Turnow place on the Upper Satsop River will be constructed, Mason County being requested to share the expense.

Dams

Calif., Napa—Contracts totaling over $200,000 for the construction of the dam in the Milliken Canyon project, which will give Napa a municipal water system, have been awarded as follows: Bordwell & Zimmerman, of Calistoga, were awarded the contract to construct the dam at a cost of $117,980. The contract to furnish 25,000 sacks of cement for the dam was divided between the F. G. Noyes Company and the Napa Lumber Company, both of Napa, at a total cost of $77,000. Steel for reinforcement will be supplied by the Badt-Falk Company of San Francisco for $1,636.80. The gate valves will be furnished by the Water Works Supply Company of San Francisco. The cost will be $844.70. Contract for all iron work to be used in the construction of the dam was awarded to the San Francisco Engineering Company for $4,268.

Calif., San Diego—The estimated cost of raising Switzer Canyon dam is $28,463, according to a report filed with city council by city engineer, F. A. Rhodes. The proposed improvement includes raising the height of the dam, $19,207, extending the conduit, $989, and construction of a spillway and channel, $6.911.

Highways

Calif., Yreka—A contract for construction of a section of the Salmon River road has been awarded to the Warren Construction Company, of Oakland, for $92,201.

Calif., San Francisco—Contract for the construction of a boulevard from Lincoln Park to Sutro Heights has been awarded to James McElroy by the Board of Public Works. The road will cost approximately $56,000. It will be constructed between the base of the cliff and the lines of the Market Street Railway.

Calif., Oroville—Contract for the construction of nine miles of county road near Honcut has been let to Heafey, Moore & McNair, of Oakland, by the board of supervisors; price, $73,089. Work will start at once. Collins & Seppi, of Oroville, were awarded contract for construction of 6½ miles of the Chico-Butte City county road. The Neill grade from the highway near Durham to Paradise will be built by day labor. H. H. Hume, county engineer, will be in charge.

Ore., Portland—Bids on approximately $800,000 worth of additional highway work which it is proposed to carry out during the coming season are being advertised by the state highway commission. In addition, plans for over $550,000 of federal forest highway work in which the state will cooperate were approved and bids will be called for shortly by the U. S. Bureau of Public Roads. The next meeting of the highway commission is set for March 27, at which time the bids will be opened. Among the projects being advertised are the following: Pacific highway Eugene to Goshen, re-surfacing and widening pavement, 4.8 miles, estimated cost $120,000; Roosevelt highway in Coos county, grading, Fat Elk to Lampa Creek, between Coquille and Bandon, estimate $200,000; Roosevelt highway in Lincoln county, grading, Agate beach to Otter rock, estimate $200,000. Bids to be called shortly by government engineers for which the sum of $550,000, including forest and state money, is available, include the following: Alsea highway from Waldport to Corvallis in the Siuslaw national forest, grading from Waldport to the Benton county line, sum available, $48,000. Roosevelt highway in Lincoln county, Siuslaw national forest, grading from Devils Lake to the Siletz River and completion of rock surfacing from Siletz River to Neskowin, $217,000. Eugene-Florence highway, Siuslaw national forest, grading from Blachly to Rainrock, $75,000. This is in addition to $300,000 already provided for this road. Crater Lake highway, Crater national forest, gravel surfacing from Prospect to the national park boundary, nine miles, $67,500. Mount Hood loop highway in Oregon national forest, south from the north boundary of the forest reserve, gravel surfacing, $37,500. Coast highway in Coos County, Umpqua national forest, Hauser to Douglas county line, grading, $110,000.

Ore., Portland—John Hampshire has been awarded contract for grading 8 2/5 miles of the Crater Lake highway in Jackson County, on a bid of $132,237.

Utah, Ogden—Engineer B. J. Finch of the bureau of public roads for the states of Utah, Idaho and Wyoming has announced that an extensive campaign of road construction in those states is outlined in the estimate and plans of the bureau of public roads. The official notice reads as follows: Idaho—North fork Payette No. 2, ten miles located between Gardena and Banks on the Payette River; Salmon-Montana line, 10 miles from Gibbonsville to Montana line on the north fork of Salmon River; Lowman-Stanley, 7 miles from Lowman up south fork of Payette River; Soda Springs-Freedom, from Freedom west; Ketchum-Clayton, a section near the old town of Galena; Warren wagon road 6 miles. Utah—Panguitch-Tropic 8 miles through Red canyon; Bryce canyon, 4 miles leading to Bryce canyon hotel; Cedar-Long Valley, Kane County section, 13 miles, which will complete the road from Cedar west to state highway on Sevier River. Wyoming—Salt Creek-Smoot, 4 miles, an extension of state road from Cokeville north; Wind River, an extension of the road over Wind River mountains to Moran, 17½ miles. Notices to contractors will be ready within a few days, giving location, quantities and character of work; also announcing date that proposals will be received. Sufficient time will be allowed for prospective bidders to inspect the projects. Other proposed construction will be announced as rapidly as plans can be completed.

Utah, Ogden—Work on the Riverdale viaduct will begin on July 1, according to announcement from the office of the U. S. Bureau of Public Roads in Ogden. A bridge will also be built. Estimated cost of bridge and viaduct is given as $300,000.

Wash., Kelso—Bids will be received and contracts awarded on March 27 for 5.3 miles of paving from Kelso north and 4.6 miles from Castle Rock south, the jobs to cost about $350,000, and April 10 contracts will be awarded for paving 4.7 miles from Castle Rock north, 5.5 miles from Laughlins spur north and 4.8 miles from Toledo south. This work will cost about $500,000 and must be completed by Sept. 1. The work will be allowed to set for 30 days before being opened to travel.

Wash., Seattle—A King County road project which will be up for bids shortly is a two-mile paving job on Maury Island, between Dockton and Molita, estimated by County Engineer T. R. Beeman to cost $70,000. A large piling trestle is included in the work.

Wash., Bellingham—Chris Sauset, here, on a bid of $47,418.50 received the contract for construction of the Husum-Trout Lake road in Klickitat county, 5.1 miles long, including grading and draining.

Wash., Seattle—Seattle and King County will join in the construction of an arterial highway 20 ft. wide, to open up the White Center District and the territory between White Center and Lake Burien. T. R. Beeman, King County engineer, and J. D. Blackwell, city engineer, are preparing plans for the project, which involves 7-in. concrete paving 3 miles long, costing $75,000; grading and relocating the highway will cost $75,000 additional.

Wash., Spokane—Spokane County, which has a $7,500,000 road program this year, has awarded the first work to the Mohr Construction Company. The Hite road work calls for 7 miles of crushed rock on macadam road.

Wash., Olympia—Paving of the Pacific highway between Toledo and Kalama will be completed by Oct. 1. An emergency appropriation was made of $1,670,000 for the work, and plans are now completed for letting the first contracts.

Irrigation Projects

Ariz., Phoenix—The Salt River Valley Water Users' Assn. has received sanction of secretary of interior and state legislature for an increase in its bonded indebtedness beyond the two-thirds of its capital stock allowed by law. This will enable the association to issue $1,800,000, 6 per cent bonds, payable in 15 to 25 years, for the purpose of constructing a regulating dam

at Mormon Flat, on the Salt River, the construction of control gates at the Roosevelt dam, and the construction of additional hydroelectric power equipment. The gates comprise 19 steel gates in the spillways of the Roosevelt dam, while the power project involves a 7,000-hp. generator in the Roosevelt power house. F. A. Reid, Phoenix, is president of the association.

Calif., Oroville—By a vote of slightly better than seven to one the voters of the Thermalito Irrigation District authorized a bond issue of $275,000 for the purchase and improvement of the present system.

Calif., San Diego—Residents of the Del Mar-Cardiff district, owners of 9,000 acres of agricultural land, have organized the Santa Fe Irrigation District. The project has been promoted by Col. Ed. Fletcher. A bond election will be held to finance the district, and later a contract will be signed with San Dieguito Mutual Water Company to furnish water, piped to every 40 acres.

Idaho, Boise—Reclamation work, costing when complete $5,000,000, is being planned at Baker. A dam will be built on Powder River and will furnish water for 40,000 acres.

Ore., Pendleton—Actual construction work on the McKay Creek storage project for irrigation in Umatilla County will start this summer, involving expenditure of more than $1,000,000. The completed storage dam means supplementary water for approximately 28,000 acres in Umatilla County now under irrigation, but which do not have enough water to carry the last crops to full growth, and will give a complete water supply for 20,000 additional acres. The total cost of the project is estimated at $2,000,000.

Wash., Spokane—Three contracts have been let by Spokane County on various irrigation projects in the county, as follows: E. J. Cheatham & Sons, Spokane, contract to excavate 100,000 yd. of material for ditches and pipe lines and a contract for two miles of flume, total cost $40,000; Delivuk Orino Construction Company, Spokane, contract to construct a 640-ft. tunnel half a mile west of Spokane Bridge and passing through a solid rock point; American Wood Company, Tacoma, contract for expenditure of $62,646 in wood stave pipe. The Spokane Valley irrigation project, in charge of R. K. Tiffany, will cost more than $600,000 to complete.

Power Plant Equipment

Ariz., Tucson—Tucson Gas, Electric Light & Power Company has authorized extensions and betterments amounting to $300,000. Work will include gas mains costing $50,000, new buildings erected to house a new 850-hp. Diesel engine, new tracks, paving, etc. Sam Headman, engineer in charge of construction.

Colo., Grand Junction—Improvements to the extent of $30,000 have been authorized by the Grand Junction Electric, Gas & Manufacturing Company, which will include the construction of a new fireproof boiler house, a new boiler installation, and additional distribution facilities.

Ore., Roseburg — Improvement work at the power plant at Winchester, supplying electric power to Roseburg and the towns in the northern part of the county, is to be started at once and the capacity practically doubled. Hydraulic engineers have been making a survey of the feasibility of adding another unit and have worked out the details of the plan. It was estimated that approximately $200,000 will be spent in adding the facilities for the generation of power.

Utah, Logan—The city of Logan will hold a bond election April 2, to decide the question of issuing $200,000 in bonds for the purpose of enlarging and increasing the facilities of the city electric light plant.

Wash., Vancouver—Work has been started on a $75,000 substation to be built here by the Northwestern Electric Company, the station to be located at 8th and King Streets.

Wash., Tacoma—The city council will appropriate $45,000 for the construction of a substation for the city light department to serve the South Tacoma district this year. Work will begin soon.

Power Projects

Ore., Klamath Falls—Construction of a 22-mile transmission line from Algoma to Chiloquin to cost $60,000 will be started as soon as weather conditions permit. This work is to be done by the California Oregon Power Company and will give that concern entrance into a new field. The line will furnish light and power for the large mills of the Chiloquin district and will add about 1,500 hp. to the consumption of electricity in the Klamath district of that company. The line will have a capacity of 60,000 volts.

Ore., Pendleton—A survey of the proposed $300,000 high line from Pasco, through Umatilla to Pendleton, has been begun by engineers of the Pacific Light & Power Company and actual construction will start early this summer, and will be completed before next winter. The proposed line will carry 66,000 volts, where the present line into Pendleton only carries 20,000 volts. In addition it will mean closing a circuit so that Pendleton may be served either from Walla Walla or Pasco.

Wash., Oroville—Plans are being made to erect a hydroelectric plant on the McLaughlin Rapids that will generate upwards to 3,000 hp. The plan is to bond the district for $450,000.

Wash., Vancouver—The Clarke County Water, Light & Power Company has recently organized for the purpose of supplying electric light and power to Hockinson, Battle Ground, Brush Prairie, Orchards, Sifton, Heisson and other towns. It will secure water from springs in the mountains near Battle Ground. Papers call for $50,000 and authority to make further issues of stock to the amount of $150,000.

Railways

Calif., Stockton — Announcement has been made by Charles M. Levey, president of the Western Pacific Railroad Company, that his company will spend $1,500,000 in Stockton this year in creating and equipping a system of terminal yards in the southern portion of the city. The company has purchased 130 acres of land lying on the eastern side of the track and extending for two miles south from South St. At the greatest point this tract is a quarter of a mile wide. The new yards will have trackage for 4,000 cars, or more than thirty miles of tracks. New engine houses and terminal shops are to be constructed, and an ice plant, with a capacity of 150 tons a day and a loading capacity for 200 cars daily, will be installed. This will be the principal icing station not only for the Western Pacific, but also for the Tidewater Southern.

Calif., Glendale—Roy L. Kent Co., 130 S. Brand Blvd., is preparing working plans for a 1-story concrete depot and store building and transformer station for Glendale & Montrose Ry. Co. on east side of Glendale Ave., 400 ft. north of Broadway; station 50 x 60 ft. with stores on each side, concrete tile, art stone front, cement mission tile roof, steel sash, cement floor, fireproof transformer house, 30 x 20 ft.

Calif., Calipatria—Southern Pacific Ry. Co. is starting work on construction of the new Holtville branch to connect with line at Calipatria. Contracts for work will be let in a few days. It is desired to complete the road before hot weather. Fifty thousand ties have been delivered.

Calif., San Diego—A. T. & S. F. Ry. will start work soon on line from San Diego to Phoenix through San Felipe pass to Indio and El Centro, and from there to Yuma and Phoenix, Ariz. The right-of-way has been secured. H. G. Wells, vice-president, is in California at the present time and is inspecting the route.

Calif., Los Angeles—Lynch-Cannon Engineering Company, Chapman Building, was awarded a contract at about $530,000 for erecting new shop buildings at Union Pacific terminal site east of Belvedere Gardens for Union Pacific Railway Company. Work will include power house, 2-story, 40 x 114 ft.; oil house, 1-story, with pump pits, 36 x 112 ft.; 2-story garage building, 42 x 252 ft.; car repair shops, 1 story, 80 x 281 ft.; blacksmith shop, 2 stories, 155 x 342 ft.; boiler shop, 195 x 254 ft.; locker room, 20 x 80 ft.; frame construction, corrugated iron exterior, steel and wood roof trusses, composition roofing, steel sash, concrete and mastic floors, traveling cranes. There will also be a brick roundhouse of 10 stalls which is the first unit of a building to contain 50 stalls.

Calif., San Bernardino—H. S. Wall, mechanical superintendent of the Santa Fe lines, stated that a boiler shop, costing $600,000, a turntable, to cost $40,000, and a tin and pipe shop to cost $100,000 will be built at San Bernardino. Machinery to be installed in the boiler shop will cost $200,000. The line between Daggett and Goffs will be double tracked, at a cost of $3,000,000.

Calif., Los Angeles—Another railroad to Los Angeles harbor is now practically assured by the mayor's signature to an ordinance granting the Santa Fe Railroad Company a franchise to extend its transcontinental line into the harbor district. The extension will be 12½ miles long, branching off the company's tracks at El Segundo and will cost approximately $2,000,000.

Mont., Helena—The Montana Railway Company, Inc., has a surveying crew starting south from Miles City for its railroad line which is to extend south and west of Miles City, Mont., into the Salt Creek oil field of Wyoming. The proposed route, approximately 250 miles long, will follow either the Tongue or Powder rivers to a connection with the Chicago, Burlington & Quincy Railroad in the vicinity of Sheridan, Wyo.

Mont., Miles City—The Northern Pacific expects to do improvement work on the Rocky Mountain division in the spring. They will construct two filling-in bridges on the Helena divide at a cost of $217,000, constructing two 30-ft. girders on the Durant bridge over Silver Bow Creek, and rebuilding a mile of main line to eliminate bad curves.

Ore., Reedsport—A new freight and passenger station is to be built by the Southern Pacific Company. These buildings and some new trackage will cost around $40,000.

Utah, Salt Lake City—The Utah Central Railroad Company, a new corporation capitalized at $1,000,000, has been given permission to proceed with 50 miles of railroad in Utah by the interstate commerce commission. The new line will extend from Wellington to Huntington, with a branch to Utah Junction. The road will make available for operation a large coal mining area. James H. Mays, former congressman, is one of the principals of the new company.

Utah, Ogden—The Utah Construction Company, with headquarters in Ogden, has received instructions from the Union Pacific Railroad Company to proceed at once with the construction of the Lund-Cedar City line. Construction equipment is being moved from Ogden and Delta to Lund, Utah, where the work will be started.

Wash., Walla Walla — H. L. Wilson was awarded the contract for the grading for the extension of the Walla Walla Valley Railway Company. In addition to the grading, 15 spans of bridge must be laid and 400 ft. of pipe. The contract for the pipe has been let to the Walla Walla Concrete Pipe Co.

Wash., Longview—The Longview, Portland & Northern Railroad Company has revised plans for its single-track railway and will make it a double track line. Twenty-five miles of line will be built.

Wash., Kelso — The Nettleton-Bruce-Eschbach Company of Seattle, which is building the 12-mile extension of the Strahorn railway near Bend, Ore., was awarded the contract for grading of the Weyerhaeuser Timber Company railway route from Rocky Point to connect with the Ostrander Railway & Timber Company line, which will be extended to the Coweeman country. The extension will cost about $80,000 and work will begin at once, according to Minot Davis, secretary for the Weyerhaeuser company. All right-of-way has been obtained.

Wyo., Sheridan—Right-of-way is now being purchased by agents of the Chicago, Burlington & Quincy railroad for a new branch line which will tap the semi-bituminous coal fields in southeastern Montana. Present plans provide for the expenditure of $2,500,000 on the new division which later will be connected by a branch to the Northern Pacific at Forsyth, Mont.

Street Lighting

Calif., Santa Monica—D. S. McEwan, Santa Monica, submitted lowest bid at $33,487 for constructing reinforced concrete ornamental lighting system on Santa Monica Blvd., between Ocean Ave. and 14th St., and at $29,388 for that section between 14th St. and the city limits.

Calif., Redlands—City trustees have plans under way for street lighting to cost about $10,000. Petitions have been started to add $5,000 to the street lighting projected. Lights have been installed on Colton Ave. between Orange and the west city limits. They will soon be ready for use on Colton Ave., east to the University of Redlands. Eureka St. is to be lighted from Brookside Ave. to Cypress St. and Buena Vista Ave. is also to be improved.

Calif., Taft—An ornamental lighting system with 71 electroliers will be constructed on the principal streets of Taft. Other improvement work coming up includes about 7,000 lin. ft. curb and 4-ft. sidewalk and about a mile of street paving. E. M. Lynch, Central Building, Los Angeles, engineer.

Colo., Denver—In addition to several ornamental street lighting projects planned for the spring, new lamps at street intersections in the residence portions of the city have been authorized by the city council. About 150 new installations will be made consisting of arcs, 400-cp. incandescents, and a number of 80-cp. brackets. Serious thought is also being given to the illumination of all alleys in the business section of the city.

Wash., Aberdeen — Bids for an ornamental electric street lighting system are being called for by the city. Complete specifications are in the hands of the city engineer. The lights are to be installed on Heron, Wishkah, G and H Streets and on Broadway.

Streets and Sewers

Calif., Anaheim—Waard & Co., contractors of San Diego, have been awarded the contract for the ocean end of the outfall sewer to be constructed by the cities of Anaheim, Santa Ana, Fullerton and Orange. The company's bid was $43,000 and includes the furnishing of 1,000 ft. of 42-in. segmental block pipe. Contract for the structure over the screening plant was awarded to Cox & Texet of Santa Ana on a bid of $10,980.

Calif., Vacaville—April 3 has been set for an election to vote bonds totaling $40,000 to improve the streets of Vacaville.

Calif., Newport Beach—Board of trustees will call a bond election May 10 for $200,000 for the installing of sewer and water mains and street lights on Balboa Island, and for a pumping plant and a bridge on north side of the island.

Mont., Anaconda—Harrison Ave. is to be paved at a cost of $180,000 for grading, paving, storm sewers, catch basins and other requisites for curb to curb pavements.

Utah, Ogden—The Security Bridge Company, which is building the main outfall sewer system for the city, was the lowest bidder for the construction of the sewer system in district 149, which is all the region north of Sixth Street in the Third ward. The bid was $77,950 and the bidder agrees to have the work completed within 150 days. The bids were referred to the city engineer for tabulation and report.

Wash., Seattle—City council has decided to proceed with the grading and paving of Fauntleroy Avenue and Avalon Way, in West Seattle at a cost of $250,000, upon petition of property owners. The total distance is three miles.

Wash., Centralia—The city commission is completing plans for paving of approximately 50 b'ocks in the First, Main Street and Washington Avenue districts. N. W. Avery, city engineer.

Wash., Chehalis — The Albers Construction Company, here, has taken over a contract to build 3¼ miles of concrete pavement on the National Park highway, from Elbe, Pierce county, toward National. The roadway is to be 18 ft. in width. The Elbe contract was originally let to B. N. Bartlett of Portland.

Wash., Anacortes—The city council has decided to authorize the largest paving project ever done in Anacortes. The work will cost about $115,000 and includes 3rd Street to 9th Street and F, X, M and N Avenues.

Wash., Pullman—The city plans to cooperate with the state to continue the sewer for about a mile farther and build a new septic tank and disposal beds at a cost of at least $50,000, bonding the city for their share.

Waterworks

Calif., Chico—At an election held on March 3, for the purpose of deciding whether or not the city would take over the three water companies in this district and provide $475,000 in bonds for the purchase of same, the voters approved the purchase of the three separate units but the bond issue failed to carry. As the money cannot be raised by taxation, which would carry the city beyond its legal limit of indebtedness, petitions are again being circulated for another bond election.

Calif., Los Angeles—Public service commission, water department, has received a communication from the Sawtelle chamber of commerce, asking for a solution of the water problem in that district. Bonds in the sum of $275,000 were recently voted, but owing to legal difficulties, the funds will not be available for a year or more. In the meantime, the chamber petitions the commission to secure a temporary loan to finance the construction of a water system in the Sawtelle district, recently annexed to Los Angeles. Wm. Mulholland, chief engineer, water department, states that the water system in use at that point is antiquated and inadequate. The matter was referred to the legal department for report.

Calif., Ventura—$250,000 Ventura water bond election passed by a vote of 9 to 1. $220,000 will be spent for the purchase of the Edison company's water system.

Ore., Vernonia—All bids for the construction of the new $40,000 water system were rejected because they did not come within the limit desired by the city council. A few changes have been made in the plans by Stiger & Lincoln, consulting engineers of Portland, and readvertisement for bids has been ordered by the council.

Wash., Everett—City council has under consideration the plans for the proposed new water reservoir, and bids will be called for shortly for the big project. Plans call for a basin 400 ft. square, 22 ft. deep, concrete lined; an adequate system of sub-drainage; a 20,000,000-gallon reservoir, with water surface of about 160,000 sq. ft. Excavation necessary before lining is estimated at 175,000 yd. External equipment included in plans consists of a control house, baffle spillway and outlet and intake lines. The project, completed, is estimated to cost $350,000, for which a bond issue has been voted.

Wash., Kelso—The Long-Bell Lumber Company has applied for the right to appropriate water from the north and south forks of the Goble River under a construction program involving an expenditure of $663,445. Two dams will be built and the water will supply the city of Longview as well as the huge lumber mill.

Miscellaneous

Calif., Santa Barbara—City council has tentatively approved the project to bond the city for the purchase of the Ambassador grounds, for a public park, at a cost of $250,000. George S. Edwards of the chamber of commerce has been asked for a detailed report regarding the project.

Calif., San Diego—Union Oil Company has purchased a tract of land from H. S. Kibbey Lumber Co., Lakeside, adjoining the lumber yard, and will erect structures and storage tanks for a district oil station. Construction will begin at once. The storage facilities will include four tanks with a combined capacity of approximately 80,000 gal. gasoline. There may possibly be added another tank for distillate. A high wire fence will enclose the plant. The district station will be moved from El Cajon as soon as the buildings are ready for occupancy.

Calif., Fullerton — Orange County Brick & Tile Co. has been recently incorporated and financed by Fullerton capital and plans to erect a brick and tile plant south of the Fullerton pumping plant. The plant will have a capacity of approximately 40,000 brick a day, and will cost $50,000. The men back of the project are: F. C. Krause, J. W. Carmichael and J. J. Lilley.

Calif., Los Angeles—Los Angeles harbor commission has given the Shell Oil Company of California, a 21-year lease on 6.7 acres on Mormon Island at the harbor for an oil exporting station. The city will build an open wharf at a cost of $100,000 and the oil company will spend several hundred thousand dollars erecting storage tanks. The city will receive a rental of $4,674 a year and a fee of ½ cent per barrel on all oil handled over the wharf. This, with other city charges, will in a few years, it is said, reimburse the city for the cost of 5.1 acres included in the lease purchased from Hancock Banning at a cost of $256,250.

Calif., Sacramento — The Pratt Rock and Gravel Company, recently organized by Clarence F. Pratt, president of the Pratt Building Material Company, soon will build a $200,000 rock and gravel crushing plant between Sacramento and Folsom, near the Placerville branch of the Southern Pacific Railroad, according to a recent announcement.

Colo., Denver—A fifty per cent conversion to central station service will be effected in the remodeling of the Masonic Temple about April 1. The first two floors will be torn out and entirely remodeled at a cost of $200,000. Main wiring service will be provided to tenants by the building association but the former will be required to install all sub-service, lighting fixtures and window lighting arrangements.

Wash., Wenatchee—The Great Northern Railway is planning to build a new freight depot beginning work about the first of April. The building will be 50 x 300 ft. and is to be located on Thurston Street, south of the passenger station. The company is also planning the remodeling of the passenger station and paving and curbing of the station surroundings. The grounds are to be beautified.